UNIVERSITY of LIMERICK

OLLSCOIL LUIMNIGH

Investigating the Use of Adventure Education in Fostering Social Skill Development in Students with Autistic Spectrum Disorder

Jack Neylon

Submitted in fulfilment of the requirements for the degree of a Master of Science in Physical Education at the University of Limerick.

Supervised by Dr. Melissa Parker and Dr. Daniel Tindall

Submitted to the University of Limerick, October 2019

Abstract

Social skill deficits are mentioned as a common feature of autistic spectrum disorder (ASD) (Task Force on Autism, 2001). There is, however, a distinct lack of evidence-based programmes to help foster social skills amongst this population (Healy and Flynn, 2012). The purpose of this study was to examine the extent to which involvement in adventure education can help foster social development in students with ASD. Specific research questions were: what areas of social thinking are most enhanced through in adventure education and how can adventure education foster social skill development in students with ASD.

Ten, male students aged 13-18, who had a diagnosis of ASD, were participants during a special summer school programme. These students attended an ASD class, offered through a mainstream Irish secondary school. During the four-week programme, students took part in four adventure education classes a week as part of their physical education programme. Quantitative data sources included pre/post social skills assessment using the Autism Social Skill Profile (Bellini and Hopf, 2007). Qualitative data sources consisted of: daily observations by the teachers, the special needs assistants, and the researcher, and student drawings.

Quantitative analysis revealed an improvement in all social skills measured, identifying "initiation", "getting the big picture" and "understanding the perspective of others" as areas with significant improvement. Qualitative findings indicated advances in students' "initiation" of social interaction and "understanding the perspectives of others", outside a physical education context. Qualitative analysis has also highlighted the transferal of social skills to settings outside of physical education. Student drawings showed that students had acknowledged the importance of social cognition in the completion of their adventure education tasks.

The results indicated that students' involvement in adventure education classes helped foster social skill development and that some of the social skills were transferred to settings outside of physical education. It was evident from the results that social skills could be targeted using adventure education. This shows the potential of adventure education as a possible teaching strategy for students with social skill deficits, like ASD. The results also highlight the need for students' with ASD to experience a physical education curriculum that is specific to their needs, with a focus on adventure and outdoor education.

Declaration of Originality

"I hereby declare that this project is entirely my own work other than the counsel of my supervisor and that is has not been submitted for any academic award, or part thereof, at this or any other education establishment."

Signed: _____ (Author)

_____ (Supervisor)

Acknowledgements

I would like to sincerely thank and acknowledge those that contributed to the completion of this research project.

To my supervisors, Dr. Melissa Parker and Dr. Daniel Tindall. Thank you for all your support, guidance and opportunities over the past three years. Without it, I would not have been able to complete this research and for that I am very grateful.

To the principal and teachers of Colaiste Muire, thank you for your co-operation and support throughout this research.

To the principal and teachers of St. Joseph's Secondary School – especially Aisling and Maureen. Thank you for your participation, patience and passion in improving education for students with ASD.

To the students of St. Joseph's Secondary School. Thank you for your participation and determination. Seeing improvement and enjoyment during this research has made it all worthwhile.

To my family and friends – especially my parents and sister Fiona, thank you for your continued support.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Abbreviations

ASD	Autistic Spectrum Disorder
PE	Physical Education
ASSP	Autism Social Skill Profile
SPSS	Statistical Product and Service Solutions

Chapter 1 – Introduction

1.1 Introduction

This chapter introduces the project undertaken to investigate the use of adventure education in the social skill development of students with autistic spectrum disorder (ASD). An outline of the research undertaken is provided as well as the purpose and significance of the study. The research questions will be defined and a structural overview of the project will be given.

1.2 Background of the Study

An interest in social skill development and social skill interventions was aroused due to personal experiences of teaching students with ASD. I witnessed the lack of a suitable intervention that helped to foster social skill development in these students. As well as this, I observed the devastating impact social skill deficits have on students with ASD. This negative impact is worsened through the lack of suitable strategies that effectively target the needs of these individuals.

The overall intent of this study was to follow-up on previous research and implement some of the suggestions outlined. In 2010, Sutherland and Stroot found that a potential approach to facilitating social interaction among individuals with autism is through adventure education programmes. Their study was carried out on a three-day outdoor adventure trip, incorporating adventure and outdoor activities. This research investigated whether or not adventure education, in a physical education setting, can help foster social skill development in students both inside and outside the classroom.

1.3 Significance of the Study

The results obtained from this research could be extremely valuable in assessing the use of adventure education as a means to influence the social skill development of students with ASD.

The results may prove to be relevant to existing and pre-service teachers and would hopefully enable and encourage them to adopt the adventure curricular model in their physical education classes. Furthermore, the results of this study should increase the awareness of social deficits that exist within individuals with ASD, in particular within Irish classrooms. It is hoped that that this study will provide a platform on which further research can be based.

1.4 Aim of the Study

The aim of this study was to investigate the impact of adventure education on the social skill development of students with ASD.

1.5 Research Questions

The research questions of this study are:

- What areas of social thinking are most enhanced through involvement in adventure education?
- How can adventure education foster social skill development in students with ASD?

1.6 Project Outline

- Literature Review (Chapter 2) provides an account of the literature relevant to specific areas of this study. These areas consist of a general overview of ASD, educational overview for these individuals with ASD, social skill deficits, potential interventions and adventure education.
- Methodology (Chapter 3) explicitly describes the process of the research. It explains in detail the design, implementation and analysis phases of the study.
- Results (Chapter 4) provides both qualitative and quantitative results of the study. Data was collected from the pre-test and post-test Autism Social Skill Profile, teacher reflections, observational logs, and student picture diaries.

- Discussion (Chapter 5) interprets the results from Chapter 4 and aims to answer the research questions of the study with support from relevant literature.
- Conclusion (Chapter 6) is a summary of the findings of this study, including recommendation for practice and the impact of this study on future research.

1.7 Glossary of Terms

Social Skills

Social skills mentioned throughout this study are the main skills being targeted in this study. However, the concept of social skills is quite broad. When social skills are mentioned in this research, they are defined as specific behaviours that result in positive social interactions, and encompass both verbal and non-verbal actions (Vogel, Meyer and Harendza, 2018).

Adventure Education

Adventure education is a curricular model within physical education and is central to the programme being investigated in this study. Adventure education is composed of activities relating to communication, co-operation, problem solving, trust and teamwork. It encourages the students to step out of their comfort zone, and learn new skills through their experience (Tindall, Neylon, Parker and Tannehill, 2017).

July Provision

This programme took place during the July Provision Programme. July Provision is a programme, which supports an additional four weeks of education for students with ASD. It requires students to maintain core subjects (Maths, English) but allows an extra focus to be placed on social skill development (Bond, Symes and Hebron, 2016).

Special Needs Assistants (SNA)

Three special educational needs assistants were involved in this study and will be referenced throughout. A SNA is an additional adult support to enable students with disabilities to maximise their potential at school. They are there to assist the student in performing the tasks required to access the curriculum (Department of Education, 2014)

Chapter 2 – Literature Review

2.1 Introduction

This chapter explores the literature relevant to this project. Firstly, Autistic Spectrum Disorder will be addressed, including the defining characteristics, history and prevalence. After this, social skills are explored, in particular the deficits that exist and the consequences of these deficits on this population. Following this, the relationship between adventure education and social skill development is explored.

2.2 Autistic Spectrum Disorder

2.2.1 History of ASD

The term 'autism' originally comes from the Greek word "autos" meaning "self". Hirai (1968) indicated that, a Swiss psychiatrist, Bleuler (1911) was the first to use 'autismus', a German word, as the term to refer to the mental states of the human beings he was studying. This 'mental state' led to the withdrawal of patients with schizophrenia into their own fantasy world. This was an effort to cope with unbearable, external perceptions or experiences (Kuhn. 2004). Bleuler falsely described autism as another form of schizophrenia; however, his description did somewhat mirror modern descriptions of individuals with ASD (Syriopoulou-Deli, 2010). As a result, the term was confused with emotional problems and schizophrenia until 1943. There was a significant difference however in the meaning of the word from Bleuler's explanation to Kanner's development of autism as a clinical condition in children (Hirai, 1968).

In 1943, Leo Kanner presented his complete definition of autism as a unique disorder under the label "early infantile autism". His paper, entitled "Autistic Disturbances of Affective Contact", aimed to characterise a set of similarly displayed features in eleven children. In each

of these children, Kanner observed strong cognitive ability with simultaneous severe social skill difficulties, limitations in spontaneity, hypersensitivity to external stimuli, excellent rote memory, and difficulty adjusting to change leading to an obsession for sameness (Martin, 2012). Kanner wrote that he had "encountered a number of children whose behaviour from earliest infancy raises the questions of an innate ability to form affective contact with people in an ordinary way to which the human species is biologically disposed" (1943, p.216). Kanner considered social withdrawal to be the primary feature of the disability, while also acknowledging that some people with autistic presentations speak, some have delay in language and others are non-verbal.

Around the same time, Hans Asperger (1944) also identified a disorder with similar difficulties to Kanner. Both researchers showed overlapping core features, particularly concerning social difficulties and repetitive behaviour. Yet, Asperger's work remained largely unknown until it was translated into English by Uta Frith in 1991. Asperger described four children who suffered from social challenges, restricted interests and stereotyped behaviours rather than a language impairment. In contrast to Kanner's patients, who displayed autistic traits before the age of two, Asperger's subjects did not necessarily display unusual behaviours until well after age three. Asperger described severe social withdrawal, obsession with routine or sameness, and individualized interests which often became additional obsessions (1944). In comparison to the previous subjects studied by Kanner, however, new participants expressed significantly better socialization and communication skills (Martin, 2012). Asperger's emphasis on autism as a social disorder was widely embraced and soon became an integral part of the diagnostic criteria for ASD (APA, 2000).

2.2.2 Defining Autistic Spectrum Disorder

ASD is a neurodevelopmental disorder characterised by the early onset of socio-communicative impairments and the display of restricted and repetitive behaviours and interests (APA, 2013; Lord and McGee, 2001; Lord, Risi and Pickles, 2004). These social impairments include deficits in social reciprocity, non-verbal communicative behaviours used for social interaction, and skills in developing, maintaining and understanding relationships (APA, 2013). There are two main diagnostic systems, the *Diagnostic and Statistics Manual of Mental Disorders* (DSM-5; APA, 2013) and the *International Classification of Diseases* (ICD-10; World Health Organisation, 2018). In relation to the DSM-5 criteria, in order to be diagnosed with ASD, symptoms should start in the early developmental period, cause significant impairments in areas such as social functioning, and should not be better explained by another condition (DSM-5; APA, 2013).

Before the most recent edition of the *Diagnostic and Statistics Manual of Mental Disorders*, there were four different types of diagnoses that individuals could receive: autistic disorder, Asperger's syndrome, childhood disintegrative disorder, and pervasive developmental disorder not otherwise specified (DSM-IV-TR; APA, 2000). However, due to substantial overlap of characteristics, there was limited agreement among specialists regarding the difference between the four subtypes. As a result, the four subtypes were merged into a single diagnostic label of ASD (Grzadzinski, Huerta and Lord, 2013).

Currently, it is widely understood that ASD affects each individual differently, with many experiencing other disabilities, such as learning disabilities, language difficulties, abnormal physical development, and hypersensitivity to sensory stimuli (Martin, 2012). In fact, it is also common for ASD to co-occur with other disorders such as attention deficit disorder and Down syndrome (Bogdashina, 2006).

2.2.3Prevalence and Incidence Rates

ASD is a disorder whose prevalence rate appears to be increasing dramatically in Ireland over the past decade. Internationally, there is a significant difference in the prevalence of ASD diagnoses between males and females, with males four times more likely to be identified with ASD than females (Government of Ireland, 2018). While no Irish data currently exist on the proportion of males and females with ASD, a study in the UK in 2013 found that the prevalence rates of ASD were 3.8/1000 males and 0.8/1000 females (Taylor, Jick and Maclaughlin, 2013).

From an international perspective, there is a trend in the prevalence rates of ASD. In Northern Ireland, the percentage of school school-age children diagnosed with ASD has increased from 1.2% in 2008-09 to 2.9% in 2017-18 (Department of Health, 2018). In the USA, the prevalence rate of ASD went from 1 in 110 (CDC, 2008), to 1 in 88 (CDC, 2014). Similar rates were reported in Sweden, where research reported a prevalence rate of 1.15 in 100 (Idring et al. 2012). Therefore, it is clear that the rate of ASD diagnoses has risen in recent years internationally.

In 2001, the Task Force on Autism (2001) estimated the prevalence rate of ASD in Ireland as 0.56:100, based on studies nationally and internationally. This figure was used by the NCSE (2006) in their implementation plan for education of students with ASD. However, more recent research has cited the prevalence rate to be 1% in Ireland (Dublin City University, 2013). In fact, the NCSE has commented that this figure more accurately reflects the number of children with ASD being supported in schools (NCSE, 2016) where there was 1.03% of students diagnosed with ASD in 2012-13. There are several potential explanations for an increase in the prevalence of autism. These include; better analytic tools, better screening methods, changes in diagnostic criteria, increased awareness and improvements in the availability of services (Rice et al., 2012).

2.3 Education for Individuals with ASD in Ireland

The implementation of the Education Act 1998 meant that everyone, including those with disabilities, has access to high quality education which is appropriate to their needs. This requires schools to provide reasonable accommodations to meet the needs of a person with a disability. Following on from the Report on the Task Force on Autism (2001), two more policies further strengthened Ireland's legislative framework for educational provision for students with special educational needs (SEN); the Education for Persons with Special Educational Needs (EPSEN) Act (2004) and the Disability Act (2005). These acts supported the rights of all children to an educational assessment or an individual educational plan (IEP). It also reinforced the Department of Education's policy of students with SEN, including ASD, being included in mainstream schools unless it is not in their best interests for this to happen (NCSE, 2013). Furthermore, it outlined how students may be supported in a special class, within a mainstream school, through either full or part-time interaction with other students in the school.

The number of schools with special classes in operation in Ireland has risen from 1,722 in 2011 to 3,983 in 2016 (Government of Ireland, 2018). In these classes, there is a staffing ratio of one teacher and at least two SNA for every six children (NSCE, 2013). There is also a requirement that all new mainstream school buildings provide special class provision for students with ASD (NSCE, 2013). Additional SNA's may be allocated depending on the individual needs of the students in each class. The role of the SNA is to assist children with special education needs who have additional needs (DES, 2014). As of 2017, there is a new model for allocating special education teachers to mainstream schools, to support students with additional needs. At post primary level, schools receive an allocation of teaching hours for students requiring learning support based on school size, on the number of if students with English as an additional language and on a fixed allocation for students with a diagnosed high-

incidence special educational need (NCSE, 2018). Under this new model, ASD is considered a low-incidence special educational need and is supported through the continuum of support within the school.

Students with ASD are also supported through the July Provision programme. This is a provision which supports an additional four weeks of education for students with ASD. Students can access this programme through home-based instruction or school-based. Home based July Provision is available if the school in which the students is enrolled is not providing the school-based programme (Bond et al., 2016). This programme is a continuation of the students' normal school day. It is required that the programme aligns with the curriculum the student receives during the normal school year, and is educational in nature (Bond et al., 2016).

2.4 Social Skills

2.4.1 Social Skill Deficits

An individual's overall successful development is typically judged on their capacity to grow and demonstrate accepted social behaviours at the right time and in the correct settings (Gresham, 2002). Dobbins et al. (2009) explained that children are often expected to exhibit appropriate social behaviours before demonstrating academic skills. Social skill deficits have been a core characteristic of ASD from the beginning (APA, 2013; Asperger, 1944; Kanner, 1943; Wing and Gould, 1979). Wing (1996) identified three social impairments currently used in the various diagnostic criteria for the disorder. Coined as the "Triad of Impairments" (Wing and Gould, 1979), these are impairments in social interaction, social communication, and social imagination (Task Force on Autism, 2001).

While the main three impairments lie in the areas of social interaction, imagination, and communication, it is extremely common for individuals to display some sort of repetitive behaviour pattern in addition. This behaviour is, however, not necessary in order to classify an

individual as autistic. At this time, there are two internationally employed and standardized diagnostic tools: The *World Health Organization's International Classification of Diseases*, 11th edition (ICD-11) and the *American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-V).

The DSM-V, published in 2013, has reduced the triad of impairments to a dyad of impairments, with social and communication deficits combined into one domain (Taheri, Perry and Factor, 2014). Although intended to be more inclusive, the new criteria inadvertently exclude children currently on the spectrum with PDD-NOS and Asperger's syndrome (McPartland, Reichow and Volkmar, 2012). However, these standardized diagnostic tools, in conjunction with an increased understanding of what autism is and is not, have allowed for significant recent progress in the autistic community. However, stigma toward these individuals has far from disappeared (Bogdashina, 2006).

2.4.2 Autism Social Skill Profile

As the number of students with ASD is increasing, there is responsibility on schools to assess social skills, and plan for suitable interventions. The *Autism Social Skill Profile* (ASSP) is one potential assessment method for social skill levels of individuals with ASD (Bellini, 2006). Bellini (2006) explained that an evaluation of social skills and social competence is a critical element of any social skills training programme. The ASSP includes 49 items representing a broad range of social characteristics typically exhibited by individuals with ASD. These social skills include initiation skills, reciprocity, perspective taking and non-verbal communication. The 49 items are rated on a four-point Likert scale ranging from never (0) to very often (3). High scores correspond to positive social behaviours, while negative scores highlight a weak social ability. This helped to provide a comprehensive measure of social functioning of children and adolescents with ASD, between the ages of 6 and 17 (Bellini and Hopf, 2007). Bellini and

Hopf (2007) highlighted that this test can be used as an intervention planning tool by identifying the specific social skill deficits of individuals with ASD. In addition, they explained that it is well suited as a pre- and post- measure of social functioning, after an intervention has been implemented, allowing teachers to quantify perceived changes in social functioning. Furthermore, the test has been shown to display excellent internal consistency, test-retest reliability and validity (Bellini and Hopf, 2007), while demonstrating the ability to detect change in social skill use after an intervention (Boyd and Ward, 2013; Block et al., 2015).

2.4.3 Social Skill Components

The triad of impairments give rise to questions surrounding socials skills and what they entail. Social skills can be defined as specific behaviours that result in positive social interactions (Elliott and Gresham, 1987; Gresham, 1986) and encompass both verbal and non-verbal behaviours necessary for effective interpersonal communication.

The iLAUGH Framework for Social Cognition is a core framework based on an extensive literature base that represents all aspects of social cognition (Smith-Myles, 2007; Winner 2014). Smith-Myles explains that the model takes an abstract concept, such as social thinking, and breaks it down into more relevant, observable components. In fact, it provides a more specific lens through which to evaluate and understand the strengths and weaknesses of students who have social cognitive difficulties. Smith-Myles concluded by explaining that an informal assessment, using iLAUGH, can be quite revealing of a student's social strengths and weaknesses.

The iLAUGH framework consists of six components: initiation, listening with one's eyes and brain, abstract and inferential, understanding the perspectives of other's, getting the big picture and humour/ human relatedness. *Initiation* (I) involves initiating language or action for interactions or tasks that are not routine. An individual's ability to talk about his or her own

topics of interest can be in sharp contrast to how that person communicates when in need of support or clarification (Whalen, Schreibman, and Ingersoll, 2006). Therefore, individuals need to be able to initiate social interactions both verbally and non-verbally. *Listening with One's Eyes and Brain* (L) looks at the individuals' ability to interpret non-verbal cues in social situations (Winner, 2014). Many individuals with ASD have technical visual processing strengths but may struggle to comprehend information presented via the dual challenges of social visual information (reading nonverbal cues) and auditory processing. This may result in difficulty with auditory processing as well as visual processing of the subtle cues provided in social interactions that facilitate social knowledge (Saulnier and Klin, 2007). "A" stands for *Abstract and Inferential*. In general, inferring is a complicated process because it forces the individual to understand an entire concept and then break it down into smaller segments, predict what will happen in the future from events presented to them in the current moment, and sequence or determine the order of events. One of the core characteristics of ASD is a presentation of rigid, or repetitive thinking, and thus being able to make an inference is often difficult for children with ASD to comprehend (Simmons-Mackie and Damico, 2003). "U" comes from individual's ability to *Understanding the Perspective of Others*. The ability to interpret others' perspectives or beliefs, thoughts and feelings across contexts is critical to social learning. It is central to group participation in the social, academic or vocational world. Individuals with social learning challenges are often highly aware of their own perspective but may struggle to see another's point of view (Winner, 2014). Related to gestalt processing, the "G" means *Getting the Big Picture*. Conceptual processing is a key component to successful social and academic functioning. It is critical to be able to be a part of and follow the group plan or share an imagination. Due to the fact that information is conveyed through concepts and not just facts, it is important that one is able to tie individual pieces of information into the greater concept. For example, when engaged in a conversation, the participants should be able

to intuitively determine the underlying concepts being discussed, as well as identify the specific details that are shared (Frith and Frith, 2010). "H" stands for *Humour/ Human Relatedness*. Students with ASD often demonstrate a sense of humour but may fail to use humour appropriately given particular contexts. This may lead to the students feeling isolated or awkward in specific social situations (Smith-Myles, 2007). There are a number of theories used to explain the source of these social skill deficits.

2.4.4 Social Skill Deficit Theories

Various theories have been used to explain the difficulties that individuals with ASD possess. There is, however, divergence amongst these theories, as each highlight different factors to explain the difficulties individuals with ASD experience. These theories include 'theory of mind', 'central coherence', and 'executive function' (Miller, 2009). The first two of these concepts, 'theory of mind' and 'central coherence', are directly related to social skills and the social impairments people with the disorder may possess and have importance to this study.

The impairment in social skills has become known as 'theory of mind', where students have difficulty processing and interpreting social situations (Mitchell, 1997). Therefore, social skill deficits from 'theory of mind' perspective means individuals with ASD have an inability to lead and interpret the non-language social cues such as smiling, tone of voice, and eye contact. This theory is intrinsically linked to the individual's ability to understand the perspective of others. For most children this is a highly developed automatic skill but to children with ASD it remains a challenge (Baron-Cohen, 2000; Griffin and Shevlin 2007). Social interaction and relationship difficulties are also considered to arise from 'theory of mind' perspective (Baron-Cohen, 2000; Frith and Happé, 1994). This explains the poor awareness individuals with ASD have in relation to personal space and social cues. Similarly, Frith and Happé (1994) explained 'theory of mind' as difficulties with social perception. This means a

difficulty understanding the points of view of others and may explain why individuals with ASD often have difficulty understanding why others don't share their interests.

However, criticisms associated with 'theory of mind' are due to the fact that non-social factors are unexplained (Happé, 2000). These criticisms highlight that there are non-social factors which affect individuals with ASD and may explain their social deficits in this area. Happé (2000) indicated that there could be environmental, mental, and biological factors that are not considered within this theory. Although 'theory of mind' is the most researched theory focused on deficits in individuals with ASD individuals, the criticism suggests there may be no theory which is thoroughly conclusive.

As well as 'theory of mind', social difficulties can also be related to a lack of 'central cohesion' or an inability to synthesise fragments of information into meaningful wholes (Frith, 1989). This theory explains why individuals with ASD have difficulty making connections in social situations as there is a focus on detail rather than the whole meaning. As a result, the world can seem chaotic and confusing which may interfere with an individual's sense of experience (Noens and Van Berckelaer-Onnes, 2005). This concept is extremely important in understanding social skill deficits in persons with ASD, as it allows for an understanding of the difficulties associated with the processing of information by these individuals. Nevertheless, it also allows an understanding of ASD in relation to non-social factors, as individuals with ASD will struggle with understanding and synthesising environmental experiences as well. For example, individuals with ASD may not pick up on social cues because they are focusing on the fragments of information that might be changing in their environment. This theory however also has criticisms, which are mainly directed at the lack of empirical evidence fully supporting the theory (Jordan, 2010). Therefore, the theories associated with ASD are mainly divergent from each other, with no common theory in place.

2.4.5 Consequences of Social Skill Deficits

Social skill deficits can have major direct and indirect consequences for people with the disorder. Social difficulties can lead to decreased independent living, decreased life expectancy, severe mental health issues, the inability to work independently, and leaves ASD individuals less likely to marry (Howlin, 2000). This leaves many with ASD to rely heavily, if not totally, on familial support. Although it has been shown there is a desire amongst those with ASD for peer interaction, this is often met with poor social support and increased loneliness when compared to their typically developing peers (Bauminger and Kasari, 2000). Marwick, Dunlop and MacKay (2005) suggested individuals with ASD show errors in judgement surrounding social situations (failure to distinguish between friendly teasing and bullying) and failure to recognise that interests are not shared by all others. This often results in shunning and bullying in schools for those with ASD (Little, 2001). In fact, impairment and distress may increase as children approach adolescence and adulthood, as the social structure becomes more complex and the person becomes more aware of a social disability (Scholper and Mesibow, 1983; Tantam, 2003). This comes as individuals begin to understand their own social difficulties and their differences with respect to others, as well as the consequences (Capps, Sigman and Yirmiya, 1995). This disability awareness can cause "frustration, embarrassment and social isolation" which may lead ultimately to psychiatric issues such as anxiety and depression (Vaughn, Bos and Schumm, 2011, p.236). What has proven helpful in dealing with these issues is the use of effective social skill interventions.

2.4.6 Social Skill Interventions

Social and interpersonal skill deficits are so obvious and often devastating for people with autism, that people have argued for the need to remediate these problems (Bemporad, 1979; Stokes, 1977). In fact, while there seems to be a decline in most autistic symptoms as

individuals get older, social impairments actually increase (Starr, Szatmari, Bryson and Zwaigenbaum, 2005). Researchers have long advocated for appropriate educational programmes for students with ASD, which incorporate an interventional experience focusing on improving numerous types of social skills (Lovass, 1987; Smith, Groen and Wynn, 2000; Williams, Johnson and Sukhodolsky, 2005; Wolstencroft et al. 2018). Social skill training groups have also shown to improve social behaviour in individuals with ASD. Tse et al. (2007) conducted research on the effectiveness of a social skills training group for verbal adolescents with ASD. In their study, 46 individuals with ASD (aged between 13 and 18 years old) took part in a social skill training group for one hour per week across 12 weeks. During these meetings, the group learned a new skill, practiced through role play and various activities. The results of this study indicate that Social Cognition, Social Communication and Social Motivation showed a statistically significant improvement over the 12 weeks. In fact, Tse et. al (2017) went on to explain that these group trainings helped increase the students' comfort in social interactions. Boyd and Ward (2013) focused on three students with ASD, interacting in three separate social skills groups with other students, who were not diagnosed with ASD. The study consisted of thirty-three 40-minute sessions. In their study, the participants were given the Autism Social Skill Profile, pre and post intervention. The three participants were reported to engage in a higher level of unstructured peer interactions. In addition, many other skills such as 'Interacts with peers during Structured Activities', 'Joins in Activities with Peers' and 'Experiences Positive Peer Interactions' all improved from a score of 2 (Sometimes Performed) to a score of 3 (Often Performed). According to Boyd and Ward (2013) programmes that approach interventions from an environmental perspective have positive effects for all participants. These include all activities which help facilitate increased social interaction between participants.

There is however currently no commonly agreed upon approach for teaching social skills to children with ASD for parents or teachers (Healy and Flynn, 2012). Weiss and Harris (2001) have stated that social deficits in this population will always be a major treatment problem. This is primarily due to the fact that no one intervention is suitable for all children with ASD due to the broad, spectrum nature of the disorder. Despite this, numerous interventions to teach social skills have been developed over the years (Carter and Hughes, 2007; Williams, Keonig and Scahill, 2007). Although many of these methods do not meet the requirements for evidence-based practice, some have been shown to increase social skills in individuals with ASD (Healy and Flynn, 2012).

Therefore, in general, there is convergence on the topic of interventions. It is clear there is a need for an intervention which would allow students to learn and understand social skills and social situations. These inventions include behaviour modification, peer-meditated training, social stories, and the implementation of a buddy system (Matson, Matson and Rivet, 2007). Yet, it is unclear as to how successful various interventions are, when implemented on a long-term scale. This view is consistent within the research, as such interventions often show less consistent results over long periods of time (Matson et al., 2007). Therefore, while there is evidence of several effective practices, there is no common, evidence-based intervention in place.

2.4.7 Social Stories

One popular example of a social skill intervention that is used in schools is social stories (Quirmbach et al., 2009). Social stories are short, personal stories written to help children understand social situations (Quirmbach et al., 2009). The story describes the situation, with a particular feeling on the child's and other's feelings and emotions. Quirmbach et al. (2009) indicated that they have been used effectively to teach social skills to children with ASD. However, Kokina and Kern (2010) have showed

that more research is needed on the effectiveness of social stories as a viable intervention. While they acknowledged that social stories helped teach the students about specific social situations, it questioned whether the students were able to apply the knowledge their learned from the situation. They explained that research into social stories did not provide sufficient data to indicate that they could build, maintain and help generalise social skills to a variety of contexts. The research into social stories as a social skill intervention highlights the need for a social skill programme that will not only teach specific skills but help to build and maintain these skills.

2.5 Adventure Education

2.5.1 Adventure Education

Within the Irish physical education curriculum, Adventure Education is a combination of adventure and outdoor education and includes a wide range of physical activities, which aims to encourage individuals to challenge themselves through engagement with one or more of the following concepts: challenge, cooperation, risk, trust, and problem solving (NCCA, 2016).

Adventure education is one of seven strands contained within the Junior Cycle Physical Education Curriculum (NCCA, 2003). Adventure education uses the natural environment to create new experiences that provide emotional, physical and social challenge to participants (Sutherland and Stroot, 2010). It can be defined as “direct, active and engaging learning experiences that involve the whole person and have real consequences” (Prouty, Panicucci and Collinson, 2007, p.12). Therefore, adventure education often falls under the conceptual umbrella of "experiential education," an educational model designed to empower participants to develop creative potential, encourages forms of expression, and offers a wide range of "hands-on" activities (Folsom and Munson, 2006). Adventure Education can be therapeutic to an individual in several ways. It is a method that can produce benefits in the affective, cognitive, and psychomotor domains (Steffen and Stiehl, 2010), allowing for the development

of self-concept, social attitudes and perceptions, shared responsibility for the safety and well-being of others in the group, and for taking risks and facing challenges (Ewert, 1989; Priest and Gass, 1997). It must be acknowledged that students with ASD may struggle with interacting with some aspects of the experiential learning process that is adventure education. This may be understanding the overarching theme or meaning attached with each activity.

For students in special education, or with special needs, these activities can foster growth in confidence and self-esteem, and break barriers of stereotypes and discrimination. They learn, like other participants, how to make choices, take turns, follow directions, and share and perform as a team, as well as receiving the physiological benefits of healthy activity (Ray, 2002). The ability to interact with others in this unique adventure environment allows individuals with disabilities to gain social competence that might not otherwise be possible (Tucker, 2009). Some of the other benefits of adventure education for individuals with disabilities include; a reduction in anxiety and stress, increased self-efficacy, interpersonal relationships, intrapersonal skills, increased confidence levels and goal setting abilities (Farnham and Mutrie, 1997). Given these benefits adventure education may serve as an effective approach in developing social skills for students with ASD.

2.6 Adventure Education and Social Skill Development

There is limited research on the use of adventure education as a social skill teaching strategy for students with ASD (Sutherland and Stroot, 2009; Zachor et al. 2016). In fact, there are two main studies which observe perceived improvements as a result of an adventure education programme.

Sutherland and Stroot (2010) highlighted that adventure activities can have a direct impact on social skills of students. Their study was carried out on a three-day outdoor adventure trip incorporating adventure activities, with participants between the ages of 10 and 14 years old. They found that positive interpersonal and intrapersonal experiences arose from the trip, with students experiencing improved levels of interaction with the other group members. This included specific improvements relating to a student with ASD (Sutherland and Stroot, 2009). Zachor et. al (2016) found similar results when looking at the effects of an adventure education programme on pre-school aged children over a twelve-week period. Their findings also found that students reacted positively to the intervention, with increased levels of social skill performance as a result of participation. In addition, significant improvements were found relating to the areas of social cognition, social communication and social motivation.

These studies, their outcomes and recommendations, have provided the foundation for this current research.

2.7 Conclusion

The purpose of this literature review was to examine existing research on autistic spectrum disorder. This included an analysis of the social skill deficits that exist, potential social skill interventions that may be useful and specifically the use of adventure education as one of these interventions. Social skill deficits have a devastating impact on individuals with ASD (Howlin, 2000), and there is a lack of evidence-based approaches in improving social skills for this population (Healy and Flynn, 2012). The relationship between these topics and this particular study is highlighted in Figure 2.1. Therefore, based on the evidence that appeared in this literature, there is a clear need to focus on the extent to which adventure education can impact the social skill development of individuals with ASD in a school-based setting.

2.8 How the Literature Informed this Research

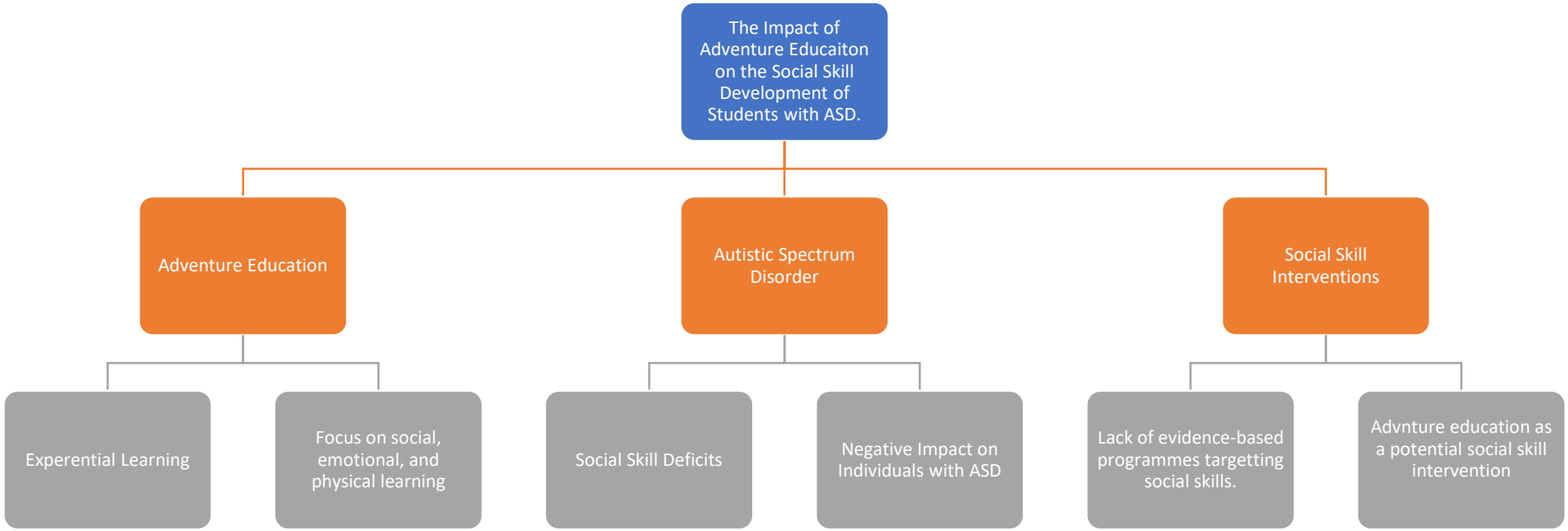


Figure 2.1: How the Literature Informed this Research

Chapter 3: Methodology

3.1 Theoretical Framework

Adventure education is strongly influenced by the experiential learning theory. This theory defines learning as "the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p.41). Therefore, it is the idea that students create their own understanding through experience of a desired action. Furthermore, "experiential learning provides learners with the opportunity to challenge themselves physically and mentally, work cooperatively as a group to solve problems and overcome risk, and gain respect for, confidence in, and trust in themselves and their peers" (Siedentop and Tannehill, 2001, p. 151).

The concept of experiential learning is embedded into adventure education with many researchers struggling to separate the two. Prouty et al. (2007) describes adventure education as "direct, active, and engaging learning experiences that involve the whole person and have real consequences" (p.4). Similarly, Prouty (ibid) added that experiential education and adventure education are merging and becoming less distinguishable, with an increased focus on the learner's overall state of mind. This reinforces the deeper approach to learning where students are more likely to remember and apply what was learned, in the future (Dewey, 1938).

Experiential learning theory combines two modes of grasping experience – concrete experience and abstract conceptualisation – with two modes of transforming experience – reflective observation and active experimentation (Kolb and Kolb, 2010). Sharlanova (2004) explained that the first stage, *concrete experience*, was concerned with the action of doing the task. The second stage is *reflective observation*, where the students review what has been done, including the methods and attitudes displayed. The third stage is *active conceptualisation*. In this stage, a discussion is formed generalising the desired skill/ concept into their everyday life. Finally, *active experimentation* is where the students actively experiment in the use of these skills (Kolb and Kolb, ibid). Experiential learning, and consequently adventure education, is a

process of constructing knowledge that involves moving through all four learning modes (Kolb and Kolb, ibid). In fact, the process is portrayed as a learning cycle, where the learner must reach each of the four sections – experiencing, reflecting, thinking, and acting. This concept of a learning cycle is displayed in Figure 3.1.

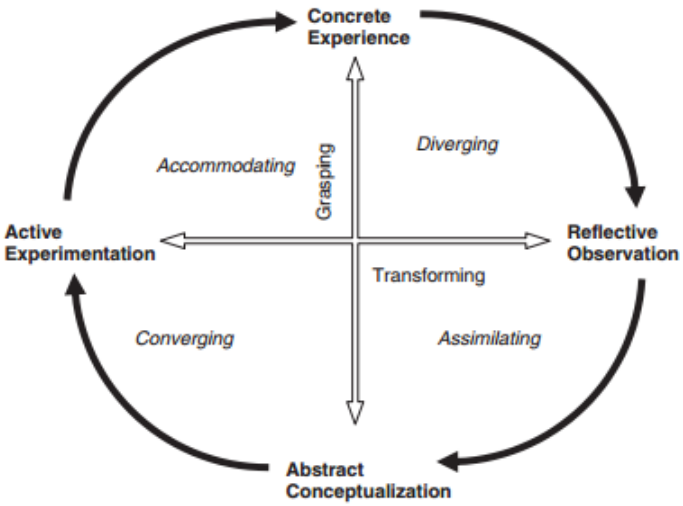


Figure 3.1: Experiential Learning Cycle (Kolb and Kolb, 2010, p.44)

3.2 Research Design

This project followed an action research approach. This idea of classroom action research was introduced by Stenhouse (1975) and promoted by Elliot (1991), and others, who acknowledged the concept of a teacher as a researcher. It is based on the idea that teachers should always be looking for potential improvements that could be made in their classroom. As stated by McNiff (1988, p.50);

> Built into action research is the proviso that if as a teacher I am dissatisfied with what is already going on I will have the confidence and resolution to attempt to change it. I will not be content with the status quo.

The fundamental aim of action research is to improve the practice within education, and not simply produce knowledge (Elliot, 1991). This type of research is conducted as a

collaborative partnership between the researcher and a group or organisation or community (Rose, Spinks and Canhoto, 2014). In this case, I (the researcher) was working within an ASD class in a mainstream Irish secondary school and actively collaborating with the SEN teachers in the school. Furthermore, Dick (2002) stated that action research is a cyclical process which alternates between action and critical reflection. This cycle was effectively summarised by Susman (1983), who indicated there were five main stages – *diagnosing*, *action planning*, *acting*, *evaluating*, and *specifying learning*. These five stages, which can be seen in Figure 3.2, help to bridge the gap between research and practice.

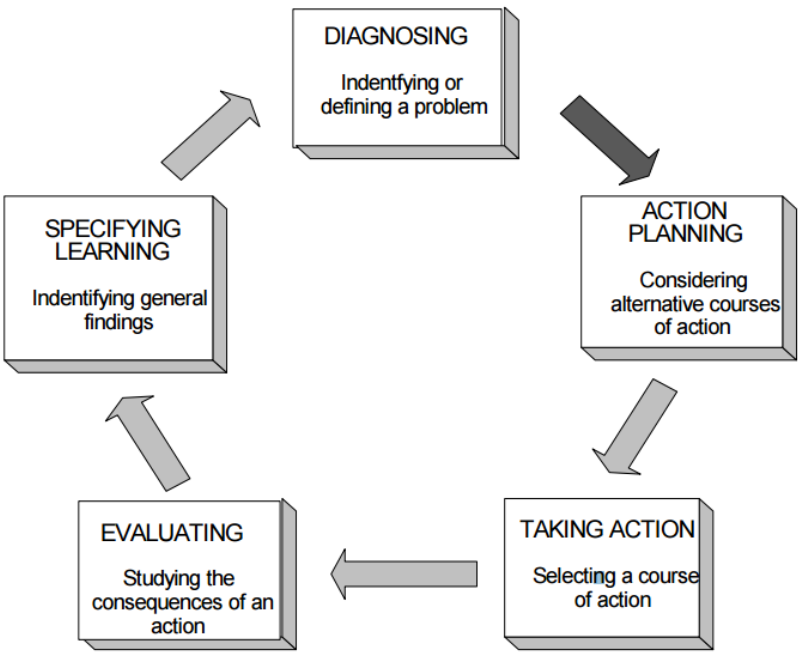


Figure 3.2: Action Research Cycle (Yasmeen, 2008)

The cyclical nature of action research was suited to this study, where the programme was repeated for two consecutive summers. This allowed me, as an action researcher, to use the plan, act, observe, and reflect on concepts before beginning the second cycle. In addition,

Coghlan (2011) explained that this is a useful method for those who are studying while working and who, like myself, undertake research in their own organisation.

3.3 Mixed Methods Research

Mixed methods research describes research design that consciously blend both quantitative and qualitative approaches within or across the stages of the research process (Johnson and Onwuegbuzie, 2004). This comes from the viewpoint that both quantitative and qualitative methods have their respective strengths and weaknesses (Cresswell, 2014). Mixed methods research seeks convergence between both approaches through robustly supporting "the findings, or to reveal complementary or even contradictory outcomes" (Saldana, 2011, p.11).

In this research, mixed method research was an attempt to "consider multiple viewpoints, perspectives, positions, and standpoints" (Johnson, Onwuegbuzie and Turner, 2007, p.113). This was an integral aspect, as it helped gain a perspective from the students, the teachers, and the observers. While qualitative methods were implemented more consistently throughout this study, the quantitative elements allowed the respective findings to be reinforced and developed. Qualitative and quantitative methods of data collection were carried out before, during, and after the July Provision Programme. As this period consisted of a relatively short time span of four weeks, it was imperative that an emphasis was placed on time-efficient research methods. The implementation of quantitative and quantitative methods proves a significant advantage by gaining multiple perspectives on the various questions being asked in this study in Year 1 and in Year 2 (Bell, 2010).

3.4 Research Questions

Table 3.1: Research Questions and Data Collection Methods

Research Questions	Methods of Data Collection
1. What areas of social thinking are most enhanced through involvement in adventure education?	• Students' Picture Diary • Teacher Reflection • Observational Log • Autism Social Skill Profile (Pre/Post Test)
2. How can adventure education foster social skill development in students with ASD?	• Students' Picture Diary • Teacher Reflection • Observational Log • Autism Social Skill Profile (Pre/Post Test)

3.5 Context

This research was carried out in a special class in a rural, mainstream secondary school in the west of Ireland. The school has a total student population of 460, with 15 students diagnosed with ASD. The school has two ASD classes, a senior and junior class. The school moved into a new building in September, 2016. The school has a designated area in the school for special education needs. This area is equipped with two classrooms, a sensory room, a garden and a withdrawal room. The research was carried out during the July Provision Programme, which is carried out in June for secondary schools completing the programme. During the research, July Provision was the only programme being run in the school.

3.5.1 Participants – Education Team

The programme staff consisted of two qualified teachers and four qualified special needs assistants, three of whom are also qualified secondary school teachers. These individuals are in constant contact with the students throughout the day, including during physical education, classroom activities and break time.

Table 3.2: Participants – Education Team[1]

Tom (Teacher/ Researcher)	The researcher, physical education teacher and adventure education teacher, working in this programme for four consecutive years (4 years teaching experience).
Tracy (Teacher)	The Special Education Needs teacher, normally taught 'Social Education' to these students during the school year (15 years teaching experience).
Sarah (SNA)	Qualified science teacher, who taught in the school during the normal school year (1-year teaching experience)
Sally (SNA)	Qualified business teacher, who had worked during this programme for the last four years (4 years teaching experience)
Sue (SNA)	Qualified English teacher, who taught in the school during the normal school year (2 years teaching experience).

[1]Names of all participants have been changed for reasons of confidentiality.

3.5.2 Participants – Student Profile

Participants were included in this study if they met two specific criteria. The first was if they attended both years of the July Provision programme in the school (involved in Year 1 and Year 2 of the study), and secondly if they attended at least 75% of adventure classes that took place during the July Provision. Therefore, 10 male students took part in both phases of this study and were eligible for inclusion (M=14.4, SD = 1.36). All students have a diagnosis of ASD using either DSM-IV or DSM-V. This is highlighted in Figure 3.3. These were the ages of the students during Year 1 of the study.

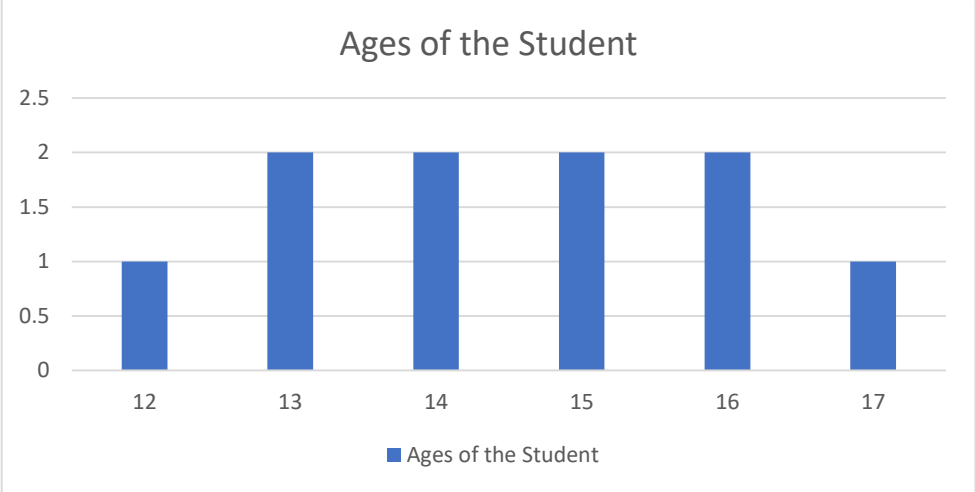


Figure 3.3: Ages of the Student Participants

These students attended an ASD class, situated in a mainstream Irish secondary school. During the academic school year, students experience classes in the mainstream setting, as well as within the ASD class, depending on the needs of the individual. The students are enrolled in either the Junior Cycle Programme (junior students) or Leaving Certificate Applied Programme (senior students). During the July Provision, these students experienced a balanced curriculum, with a clear educational focus. This meant the students studied mathematics, English, science, home economics, art, music, and physical education. The teachers and SNAs were in constant contact with the students from 9:00-14:30 for the entire 19 days of the programme. A more descriptive profile of each student is given in Table 3.3. These descriptions were given by Tracey (the SEN teacher).

Table 3.3: Description of Student Participants

Student	**Description**
Alan	• Loved art and drawing. • Difficulty recalling information and expressing himself verbally. • Got upset if routine is changed. • Liked his own company
Brian	• Enjoyed history and story-telling. • Strong language skills. • Suffered from anxiety and depression.

	• Found change in routine stressful
Conor	• Talented musician plays drums and guitar. • Needed prompts to stay on task. • Liked his own company. • Participated in some mainstream classes with support.
David	• Enjoyed watching movies. • Very sensitive to sounds. • Easily overwhelmed and suffers from anxiety. • Needed movement and sensory breaks.
Edgar	• Loved history and storytelling. • Very short attention span, difficulty with short term memory. • Very eager to research topics that interest him.
Fred	• Loved art and drawing. • Very strong visual memory. • Difficulty talking about anything personal. • High levels of social anxiety.
Greg	• Liked comic books and cartoons. • Very poor eye contact. • High levels of social anxiety.
Harry	• Enjoyed science. • Difficulty in working memory and processing information. • Participated in mainstream woodwork and science, with support.
Ian	• Enjoyed reading and writing. • Difficulty expressing himself verbally. • Inappropriate social behaviours in terms of volume/ distance. • Participated in some mainstream classes with support.
John	• Eager to learn. • Bubbly personality who likes to tell jokes. • Shy/ Low confidence in group situations. • Short attention span and needs to be prompted to stay on task.

3.6 Implementation

3.6.1 Ethics Approval

Before the research was conducted, the Education and Health Sciences Research Ethics Committee at the University of Limerick conducted a full ethics review. The letter of approval is attached in Appendix A. The study was also discussed with the school principal. An information letter was provided and upon approval, the relevant consent form was signed. The

study was then discussed with the co-operating special education needs teacher. Prepared information letters and consent forms were finally distributed to each learner, who were also invited to ask questions surrounding the study. Consent forms were signed by parents/guardians as well as each student. All students in the research groups were diagnosed with ASD and voluntarily took part in the July Provision in the school. Complete anonymity and confidentiality were assured to all participants. Templates of consent forms and information letters are included in Appendix B. Full ethics approval was granted on the 25th of May 2015, with ULREC application reference 2015_05_12_EHS.

3.6.2 Programme Design

An adventure scheme of work was developed, focusing on group work and experiential learning, where students obtained optimum class time working with each other. This adventure scheme of work was devised using the Junior Cycle Physical Education Curriculum framework and focused on specific learning outcomes. An overview of the project is given in Figure 3.4.

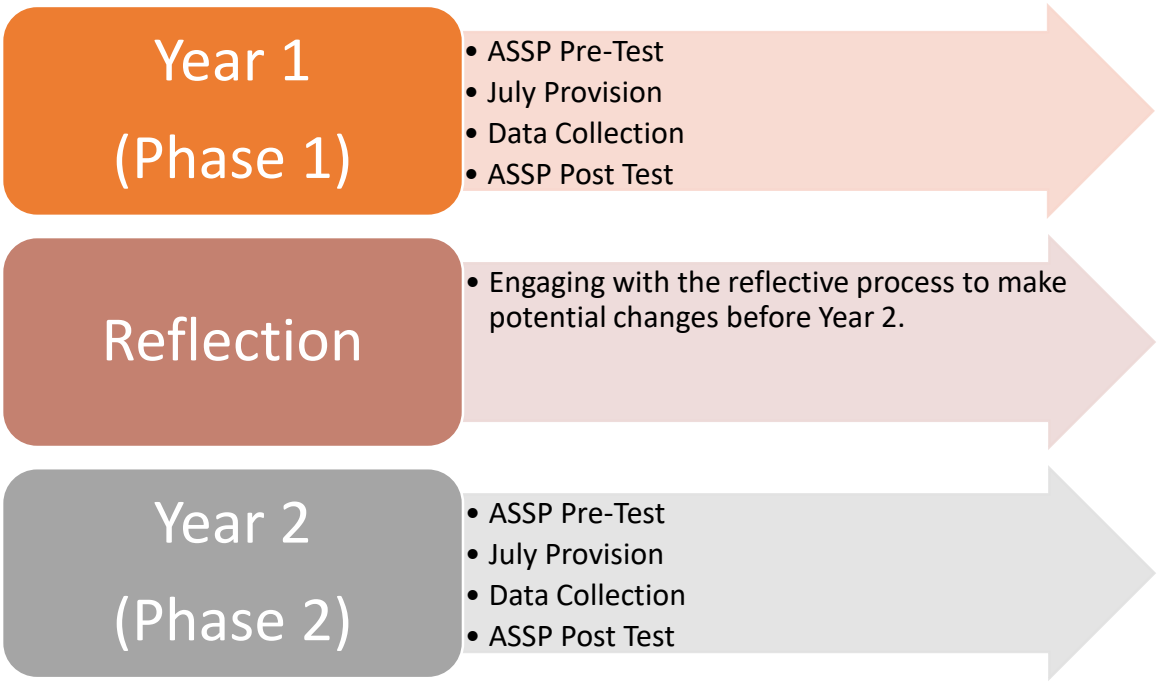


Figure 3.4: Overview of Year 1 and Year 2

3.6.3 Theoretical Framework within Adventure Classes

Since the experiential learning theory is deeply embedded into the adventure curriculum, the experiential learning cycle was used to guide the adventure education lessons. Mertens (1998) mentions that a theoretical framework should not be static but be embedded into the research constantly evolving and changing as the project develops and matures. Therefore, the stages of experiencing, reflecting, thinking, and acting were embedded into each adventure lesson. The final stage of the cycle, the acting phase, is where a perceived improvement in social skill would take place after the adventure education class. The incorporation of the experiential learning cycle into adventure lessons can be seen in Figure 3.4.

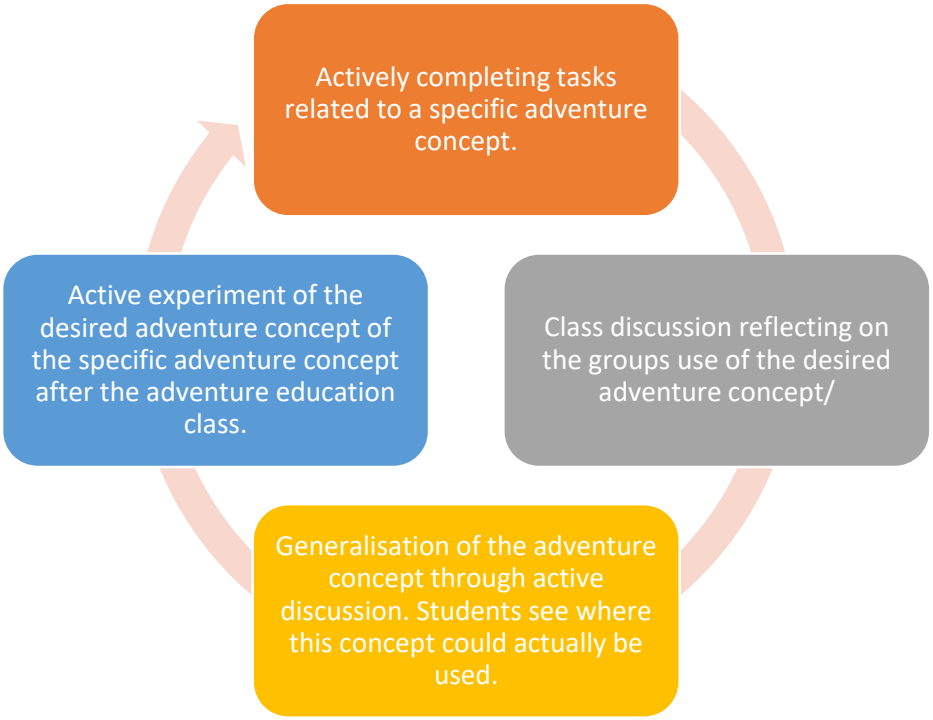


Figure 3.5: Experiential Learning Cycle within the Adventure Education Classes

3.6.4 Implementation of Adventure Classes

The programme provided funding for two special educational needs teachers and three special needs assistants. However, the three SNAs were also qualified secondary school teachers, of

English, business, and science. Adventure education was timetabled for four classes during the week (two double periods). The group was also timetabled for four PE classes in the week, which consisted of a strand other than adventure education. The students also experienced English, maths, SESE (History/ Geography), ICT (Computers), science, music, and art. This can be seen in Figure 3.5. While the same overall timetable was followed in Year 1 and Year 2 of the studies, the activities that the students experienced were different.

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-9:40	*Maths*	*English*	*Maths*	*English*	*Maths*
9:40-10:20	*English*	*Maths*	*English*	*Maths*	*English*
10:20-11:00	*SESE*	*ICT*	*SESE*	*PE*	*SESE*
Small Break					
11:15-11:50	*Home Economics*	*Adventure*	*Science*	*Adventure*	*ICT*
11:50-12:30	*Home Economics*	*Adventure*	*Science*	*Adventure*	*ICT*
Lunch Break					
13:00-13:45	*Music*	*Music*	*Music*	*Art*	*PE*
13:45-14:30	*ICT*	*SESE*	*PE*	*Art*	*PE*

Figure 3.6: Timetable – July Provision

This strand is an integral aspect of the Junior Cycle Physical Education curriculum. The adventure education curriculum combined psychosocial and experiential methods of teaching social skills, with a strong emphasis on learning in groups and from each other (Prouty et al., 2007). The classes were led by me, the researcher, a qualified physical education teacher, and supported by two qualified SNAs.

The students moved through the experiential learning cycle during each adventure class. Many of the activities that were included in the adventure education classes were adapted from the handbook: *A Handbook of Ideas: Teaching Adventure Education* (Tannehill and Dillon, 2007). This handbook was developed for physical education teachers, implementing adventure education lessons. Figure 3.6 shows the layout of the programme for the four weeks.

Week	Adventure Concept	Sample Task Year 1	Sample Task Year 2
1	Verbal Communication	Full Value Contract	Communication Relays
2	Non-Verbal Communication Co-Operation	Kayaking Trip	Hiking Trip
3	Trust	Orienteering Event	Orienteering Event
4	Problem Solving/ Team-Building	Overnight Trip to Galway	Surfing Trip

Figure 3.7: Layout of Adventure Education Programme

The pace of the adventure education content was flexible and dependent on the students' reactions and progress during various activities. For example, if the students were struggling with components of trust, some additional activities may be included in the following weeks lessons.

3.7 Data Sources

3.7.1 Qualitative Data

Qualitative research is concerned with "understanding the meaning people have constructed, that is, how people make sense of the world and the experiences they have in the world" (Merriam, 2009, p.13). Within this research, there was a focus on an interpretative, naturalistic approach (Denzin and Lincoln, 2005). This interpretative aspect allows for important insights into the experiences of the participants, including an "evaluation of the effectiveness of

programs or policies" (Saldana, 2011, p.4). Qualitative data in this research provided insights into the student experience inside and outside the adventure classroom, allowing us to interpret and summarise potential improvements (Cohen, Manion and Morrison, 2007). Qualitative data consisted of student picture diaries, teacher reflections, and observational logs. A typical day during the programme, indicating data collection points can be seen in Figure

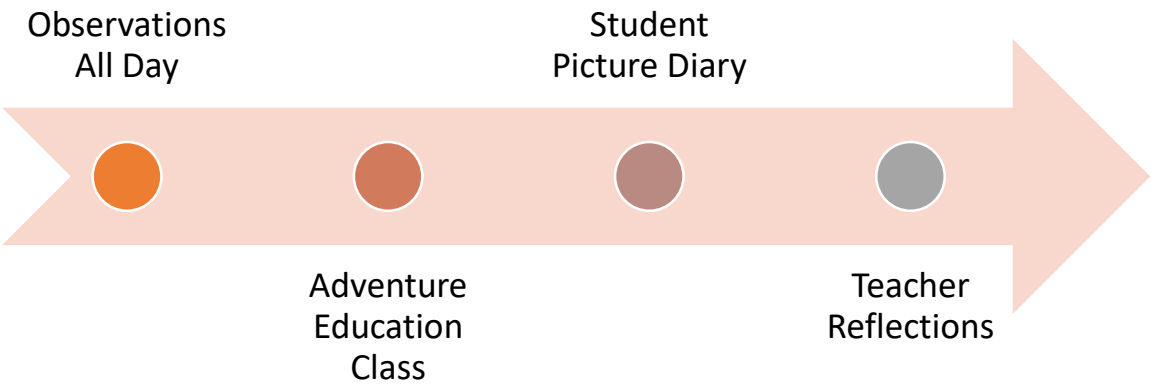


Figure 3.8: Daily Data Collection Points

3.7.1.1 Student Picture Diary

In this study, the students completed one drawing a week, at the end of each adventure lesson. In this drawing, they were asked to draw what they experienced in adventure education during that particular week. The students were also asked a short reflective question, requiring them to think about their use of the desired adventure concept (communication, co-operation, trust, etc.). These pictures formed a picture diary, which was kept in a personalised adventure folder. Sixty-four pictures in total, from these diaries, were analysed to assess how the students showed an awareness or understanding of the specific adventure concept being studied. The diaries

helped the students to reaffirm the learning that had taken place during the adventure education class. It also helped the researcher to gain an insight into the student perspective on the particular learning that took place. The pictures also allowed the students to convey emotions/ perspectives that they would normally struggle to get across verbally or through written dialogue.

Using student drawings in research is a child-centred approach. This approach shows respect for and promotes the entitlement of children to be considered as an individual of value (Green and Hill, 2005). Children's drawings have been of interest to psychologists for over a century (Sully, 1989). The use of children's drawings gives flexibility to a study, where the drawings can be used as tools for facilitating communication and to aid assessment (Di Carlo, Gibbons, Kaminsky and Stiles, 2000; Stiles, Gibbons and Schnellman, 1987). In fact, Di Carlo et al. (2000) explained that standardised testing often fails to reveal strengths, weaknesses and resourcefulness of individuals, especially those with literacy or verbal difficulties. This is particularly relevant with this particular group, where all students were diagnosed with ASD and struggled communicating verbally or through a standardised test. There have however been criticisms of using student drawings in research (Burkitt, 2004; Jolley and Vulic-Prtoric, 2001; Burkitt, 2004; Thomas and Jolley, 1998). These criticisms reference the fact that these may be misinterpreted by the researcher or the student, they may not accurately reflect the individual's personality or emotional state and they may be difficult to explain/ quantify in research. Consequently, the student drawings were not used to make an assessment of the students' social skill ability or functioning. The picture diary was simply used to highlight and reinforce if the participants were actively thinking about various aspects of social functioning, such as communication, co-operation, group work, etc.

3.7.1.2 Teacher Reflections

Teacher reflections were completed daily by the SEN teacher and me as the teacher/researcher. As teachers, we were reflective practitioners, striving to improve lessons by looking back at previous lessons. In research, reflective journals have proven to be an invaluable resource. In fact, they have been known to make the challenge of interviewing, observing and taking field notes much easier for the researcher (O'Connell and Dyment, 2014).

This reflective journal allowed teachers to look back on the school day, and track developments in the social skills functioning of the students. These reflections were completed by the SEN teacher and the researcher at the end of each day. Borton's (1970) *Framework Guiding Reflective Activities* consisting of three key questions: 'what', 'so what', and 'now what' was used to guide the reflective logs. At the end of the study, there were seventy-two teacher entries. A sample reflection entry is included in Appendix C.

3.7.1.3 Observational Log

Marshall and Rossman (1989) define observation as "the systematic description of events, behaviours, and artefacts in the social setting chosen for study" (p.79). They expand on this by explaining that there are two types of observation – obtrusive observation or non-obtrusive observation. In this research, the type of observation was non-obtrusive observation. All the students have experience working with the teachers and SNAs and they will be completing observations during normal class time. Therefore, the observation had little to no influence on the participants performance.

Furthermore, DeWalt and DeWalt (2002) explain that observations can provide a holistic understanding of the phenomena under study. This allows the researcher to build a comprehensive understanding of the context and setting of the study. In addition, they also explained that observations improve the quality of data collection and interpretation, while

facilitating the development of new research questions. Conversely, research has indicated that there are disadvantages associated with using observations. This included the fact that observations are conducted by a biased human. While it is impossible to eliminate this issue, it is reduced due to the fact that all the programme staff are fully experienced in working with students with ASD.

An observational log was kept by the three SNAs, the SEN teacher, and the researcher who worked during the programme. This consisted of various notes on social functioning and behaviour that was noticed during class time, break time and during school trips. Observations made during the physical education classes were also inputted into the log, describing the various social behaviour that were witnessed. The six components of the iLAUGH Framework, mentioned in Chapter 2, were used to guide the observations. A sample observational log can be seen in Appendix D. The observations were made at various breaks during the day (small break, lunchtime, after school). The teachers were encouraged to input their observations as soon as it occurred. At the end of the study, there were 126 observations made relating to the students' social skills.

3.7.2 Quantitative Data

Quantitative research is concerned with "measurement, precisely and accurately capturing aspects of the social world that are expressed in numbers – percentages, probability values, variance rations, etc." (King and Horrocks, 2010, p.7). This means it is associated with results that are represented numerically, allowing results to be easily compared and contrasted. This is an important aspect of this research, as it allowed for numerical values whereon to critic the effectiveness of the proposed intervention.

In this study, quantitative data were collected through the numerical value associated with the various items on the Autism Social Skill Profile (ASSP), which was used pre- and

post- analysis. Timmreck (2002) explained that a test can be given "to establish a baseline of pre-treatment data" (p.268). In addition, Berg and Latin (2008) explained that the pre-test and post-test design allows for the determination of the amount of change that was due to the independent variable; which in this case was the adventure education classes. This occurs by comparing the pre-test baseline to the post-test data (Timmreck, 2002). Consequently, the ASSP can also be used to identify perceived improvements in social skills, by comparing the results of the test pre- and post- intervention. Bellini and Hopf (2007) reported that this test can be used as an intervention planning tool by identifying the specific social skill deficits of individuals with ASD. The test can be administered by parents, guardians or school personnel who have direct knowledge of the child's social functioning (Bellini and Hopf, 2007). In addition, they explained that it is well suited as a pre- and post- measure of social functioning, after an intervention has been implemented, allowing teachers to quantify perceived changes in social functioning. Bellini and Hopf (ibid) showed that preliminary analysis of the psychometric properties of the ASSP with 340 students with ASD indicated that the instrument has strong validity and reliability for this age group of adolescents.

Three SEN teachers, who were in constant interaction with these students in school completed the ASSP before the programme in Year 1 and Year 2. After the four-week programme, the students were evaluated again by four of the July Provision Staff, including two SEN teachers and two SNAs. This occurred at the end of the programme in Year 1 and Year 2. These results were then analysed to allow for comparison pre- and post- adventure education programme.

3.8 Data Analysis

Qualitative data were collected in this study through observational logs, reflective diaries and the student picture diary. The observational logs and reflections were analysed using QSR's NVivo, version 2013. The researcher inductively and deductively coded and defined common

themes that occurred in the reflections and observations using this software. The main coding method that was used was descriptive coding, where sections of qualitative data were summarised with a word or phrase (Saldana, 2011). Firstly, the reflections were deductively coded according to the iLAUGH framework by looking at the major themes relating to the categories that were prominent. Major themes were any examples or instances directly relating to the student's performance of a social skill. After this, the observational logs were deductively coded for themes that supported the student's reflections and inductively coded for themes relating to adventure education. The student picture diaries were assessed by the researcher, the SEN teacher, and a SNA in support of the themes established.

In terms of quantitative data, results of the pre-test and post-test were analysed using IBM's Statistical Package for the Social Science (SPSS), version 22. The various social skills were allocated a range from 1 (never) to 4 (very often). Statistical analysis was then carried out on these categories using SPSS software. There were two main statistical procedures carried out; a paired t-test and a Hedges G calculation.

The results were analysed using a paired t-test, allowing us to understand the difference between the mean social skill scores pre-intervention and post-intervention. These were tested at a 95% confidence level. To reject the null hypothesis, and for a score to be statistically significant, it must lie in the 5-percentile range (i.e.: a p-value of less than 0.05).

While these results indicate whether a change is statistically significant, the small sample size (N = 10) means that there could be an element of bias included. Therefore, a Hedges G Effect Size was calculated. Hedges G Effect Size is a standardised measure of the relative size of the effect of an intervention. It is useful for quantifying effects measured on unfamiliar or subjective scales and for analysing the relative impact of an intervention (Baugh, 2002). Hedges G is useful when the sample size is less than twenty, as it considers the small

sample bias in the effect size (Hedges and Olkin, 1985). Cohen (1988) and Baguley (2009) explain that an effect size of 0.2 would be considered small effect size, 0.5 would be considered a medium effect size and above 0.8 would be considered a large effect size. However, Thompson (2007) showed these values are arbitrary and should not be interpreted rigidly. Fan (2001) suggested instead they should be used to compliment statistically significant tests, which is what was utilised in this research.

3.9 Validity and Trustworthiness

Validity is an indication of accuracy, in terms of the extent to which research results and conclusions correspond to the reality (McBurney and White, 2007), making it "an important key to effective research" (Cohen et al. 2007, p.133). Zohrabi (2013) indicates that validity is a matter of trustworthiness, utility and dependability. In this way, it becomes an integral aspect of evaluating the quality and accessibility of the research (Burns, 1999).

As mentioned earlier, mixed methods research was implemented in this study. Zohrabi (2013) explains that this use of mixed methods increases the validity of the research. However, the use of mixed methods research means that both qualitative and quantitative data were implemented throughout this study; both of which contain elements of invalidity which need to be addressed. Cohen et al. (2007) explained the subjectivity of respondents, including their opinions and attitudes, together contribute to a degree of bias. Similarly, quantitative data also includes an element of "standard error which is inbuilt and which has to be acknowledged" (Cohen et al. 2007, p.133). While these elements do contribute to a degree of invalidity, they must be accepted in this type of research.

Furthermore, there are two main types of validity that must be looked at for the purpose of this research, internal and external validity.

Internal validity is concerned with the congruence of the research findings with the reality (Zohrabi, 2013). Basically, it indicates whether an intervention or treatment impacted the outcome of the research (Yu and Ohlund, 2012). This is an extremely important aspect of any research because the researcher's confidence in their results is proportionate to the strength of the internal validity of the project (Finger and Rand, 2003). *External validity* is concerned with the applicability of the findings in other settings or with other subjects (Zohrabi, 2013). Burns (1999) explained that this refers to the ability to generalise the results of the experiment to other persons, settings, and time.

Yu and Ohlund (2012) highlight seven threats to the internal validity of a research project. These are history, maturation, testing, instrument, statistical regression, subject selection and experimental mortality. The impact seven features have on my study is explained in Table 3.4.

Table 3.4: Research Internal Validity

History	History was accounted for in this study, as the whole group will be working through the same adventure programme over the four-week period; both in Year 1 and Year 2. As such, the pre-test, intervention and post-test occurred at the same time for all participants.
Maturation	Maturation was controlled through this study as it was expected that all participants would mature at a constant rate so not to affect Year 1 or Year 2.
Testing	Testing was kept constant throughout this study. This meant that the pre-test and post-test were kept the same to ensure that any change in results was constant between the pre-test and post-test. The ASSP was also kept the same in Year 1 and Year 2.
Instrument	The instrument, adventure education classes, was aligned with the Junior Cycle Physical Education Curriculum for the duration of the four-week programme in Year 1 and Year 2.

	The ASSP has been shown to have excellent internal consistency, test-retest reliability and validity (Bellini and Hopf, 2007)
Statistical Regression	The participants were all students diagnosed with ASD and currently enrolled in the same Irish mainstream secondary school. Therefore, this means that it was a mixed-ability group, academically and socially and as such there should be no extreme social skill scores and regression towards the mean was accounted for in this study.
Subject Selection	Since this was an action research project, the participants were all students who participated in the July Provision Programme. This means that they were all diagnosed with ASD and attend the same Irish secondary school. Since all eligible students were participating, there was no need for random selection with this group.
Experimental Mortality	For the purpose of this research, results of participants who were present for at least 75% of the adventure education classes were included.

In terms of external validity, the research also needs to be examined to see if it can be transferred to other situations. This is explained in Table 3.5.

Table 3.5: Research External Validity

Reactive Effect of Testing	While this research does involve a pre- and post-testing of the students' social skill ability, it did not directly impact the students' social skill level. The tests were carried out by the SEN team and the students were not made aware that they were being assessed.
Population/ Setting	Population/ Setting looks at the ability of the results to generalise to other populations and settings. This was difficult to control, as the intervention was carried out on an all-male population, from the same Irish secondary school.

Overall, these threats to both internal and external validity have been considered and accounted for to "minimise invalidity and maximise validity" (Cohen et al. 2007, p.133).

Furthermore, there were other aspects of this research that increased the trustworthiness of the data. Firstly, there was multiple data sources from a variety of contexts. These sources included data collected from the teacher, the researcher, the SNAs, the students and the SEN teachers; including qualitative and quantitative data. This allowed for data and researcher triangulation. Heale and Forbes (2013) explained that third multi-perspective interpretation added richness and depth to research, where results can be compared to show divergence or convergence. Secondly, there was a prolonged engagement between the researcher and the group, as the researcher has been involved with the group for four years prior to this programme. The students were comfortable with the educational staff and were accustomed to taking part in new experiences during the July Provision Programme.

3.10 Limitations and Researcher Subjectivity

While a conscious effort was made to avoid limitations and bias, there were some aspects that need to be acknowledged.

- Sample Size – A small sample size was used in this study (n = 10). While this figure is a small sample size for quantitative research, it was an acceptable number. Currently, the prevalence rate for ASD in Ireland is at 1% (Dublin City University, 2013). For a school of 400 students, this means that there was an increased number of individuals than what would be expected for a school of this size. A Hedges G Analysis took place during the quantitative data analysis to reduce small sample size bias. However, the sample size was quite significant for qualitative research, allowing for a rich picture to be created of the social skill development of the students. It must be acknowledged that this was a very small class when compared to a class during the regular academic year, which would be larger.

- One School – The participants in this study attended the same mainstream secondary school. As a result, was difficult to generalise the results across all secondary schools in Ireland.
- One Gender – All participants in this study were male. Therefore, it was difficult to apply the results of this study across the gender domain. However, this was also expected at the start of this research since autism is four to five times more common in males than females (Cooper, Smith, and Russell, 2007).
- Improvements in social skill performance may be due to familiarity with peers and the programme and not solely adventure education classes.

As well as this, the efforts made to reduce research subjectivity also need to be discussed. All teachers and SNAs involved in this project have a strong, working relationship, which has been built on a common goal to improve the education for students with ASD. There exist high levels of regard for each other's opinions and points of view. This regard, together with the longevity and multifaceted extent of our relationship, allowed for open discussion on the developments of the students in the class. Although, I am confident on the ability of all stakeholders to remain impartial, focusing on the process and student improvements, I would have to acknowledge the hope that exists amongst the teachers and students for the students' success. Every effort was made to control and reduce potential subjectivity and bias. We constantly observed the students throughout the school day, including before school, after school, lunch times and school trips. We regularly discussed and reflected on the observations that were being made. In addition, multiple methods were used to collect data to ensure that any element of bias or subjectivity was reflected and reduced.

3.11 Reflective Process

Between Year 1 and Year 2 of this study, the researcher engaged in the reflective process of the action research cycle to implement improvements to the research. During this time, two specific improvements were made to the study prior to engaging in Year 2. These were:

- A student profile was created, giving information about the 10 students involved in the study. This highlighted the critical needs of each student and gives more information to external readers of the research.
- Social validity checks where incorporated into the reflection aspect of the adventure classes. This allowed students to give more feedback as to what aspects of the classes they are really learning from and enjoying. This allowed students to gain an additional voice within the research.

Chapter 4 – Results

4.1 Introduction

This chapter presents the main findings of this research, focusing the data on the two research questions outlined in Chapter 3. While the data were collected in two phases, the main focus was on the social skill improvement during each phase, and not during the time between phases. Therefore, all data collected in phase one and phase two of the intervention are incorporated together into these three sections.

Firstly, the results from the ASSP are presented. This chapter then highlights four key findings that resulted from the qualitative and quantitative data analysis. These four themes are: social skill growth, emotional development, transferability, and adventure education (Figure 4.1).

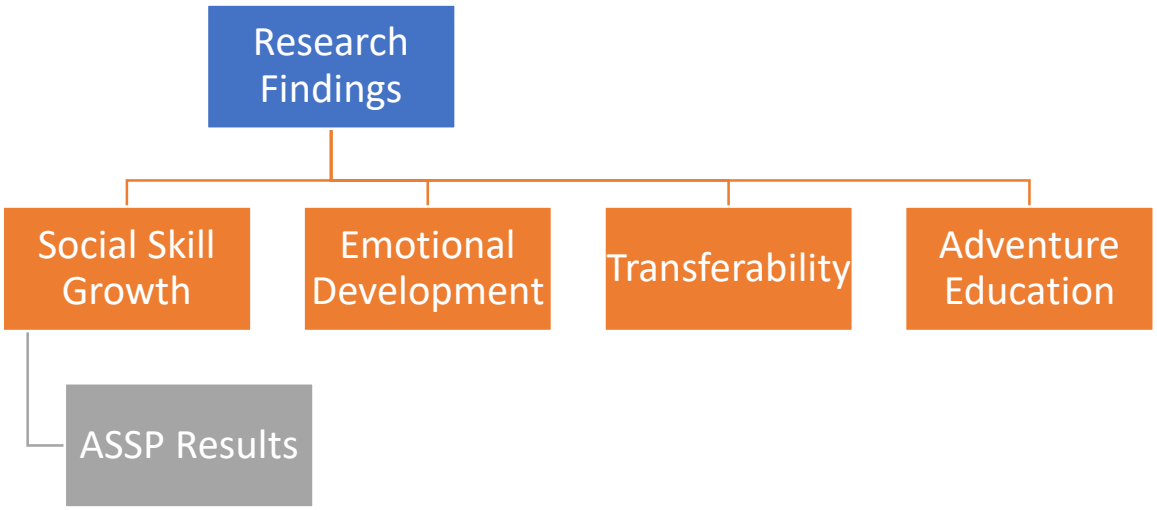


Figure 4.1: Research Findings

4.2 Autism Social Skill Profile

The ASSP (Bellini, 2006) was used to provide quantitative data on the improvements in social skills over the course of the intervention. Table 4.1 highlights the thirty skills that were analysed during the research.

Table 4.1 Autism Social Skill Profile – Skills Assessed

Invites Peers to Join Them in Activities	Interacts with Groups of Peers	Maintains Eye Contact During Conversations
Joins in Activities with Peers	Maintains the 'Give-and-Take' of Conversations	Maintains an Appropriate Distance When Interacting with Peers
Takes Turns During Games and Activities	Expresses Sympathy for Others	Speaks with an Appropriate Volume in Conversations
Maintains Personal Hygiene	Talks About or Acknowledges the Interests of Others	Considers Multiple Viewpoints
Interacts with Peers during Structured Activities	Recognises the Facial Expressions of Others	Offers Assistance to Others
Asks Questions to Request Information about a Person	Recognises the Non-Verbal Cues or Body Language	Verbally Expresses How They are Feeling
Asks Questions to Request Information about a Topic	Requests Assistance from Others	Responds to the Greetings of Others
Engages in One-on-One Social Interactions with Peers	Understands the Jokes or Humour of Others	Joins a Conversation with Two or More People without Interrupting
Initiates Greeting with Others	Introduces Self to Others	Compromises during Arguments
Acknowledges Compliments Directed to Them by Others	Provides Compliments to Others	Experiences Positive Peer Interactions

The ASSP was used in year 1 and year 2 to give an indication of the student's level pre and post the July Provision programme. Table 4.2 highlights the social skills for which improvements occurred over the 4-week programme. In this table, the pre-post test scores in Year 1 and Year 2 were combined. This allowed the focus to be placed on the improvements made over the course of the four week programme. The table shows that al social skills showed an increase between pre and post scores.

Table 4.2 Comparison of Means Pre-Test/Post-Test with Mean Changes and Hedges G Calculation

ASSP	Pre-Test Mean	Post-Test Mean	Mean Change (Improvements)	Hedges G Corrected Bias
Invites Peers to Join Them in Activities*	1.7000	2.4000	+0.8	0.80
Joins in Activities with Peers*	1.3000	2.1000	+0.8	0.95
Interacts with Peers during Unstructured Activities *	1.2000	2.1000	+0.9	1.23
Interacts with Peers during Structured Activities *	1.5000	2.5000	+1.0	1.12
Engages in One-on-One Social Interactions with Peers	1.9000	2.5000	+0.6	0.80
Maintains the “Give-and-Take” of Conversations	1.7000	2.1000	+0.4	0.49
Expresses Sympathy for Others *	1.4000	2.2000	+0.8	0.94
Talks About or Acknowledges the Interests of Others	1.4000	2.1000	+0.7	0.93
Offers Assistance to Others	1.4000	1.7000	+0.3	0.42
Verbally Expresses How They Feel	1.3000	1.4000	+0.1	0.19
Considers Multiple Viewpoints	1.4000	1.8000	+0.4	0.66
Responds to the Greetings of Others	2.0000	2.2000	+0.2	0.44
Introduces Self to Others	1.2350	1.5000	+0.265	0.52
Experiences Positive Peer Interactions	1.3000	1.9500	+0.65	0.83

* = Indicates a large effect size.

4.3 Social Skill Growth: 'I've never seen something like this before'

The first theme reflects the positive impact that adventure education had on the social skill growth of participants. As previously mentioned, social skill is a broad concept which encompasses many skills, making it difficult to explore through a qualitative lens. Therefore, the iLAUGH Framework was used to break-down and explore what social skills were being developed during this programme. Quantitative data provide an overview of three skills from the iLAUGH Framework which were improved during this programme; "Initiation of Social Interaction", "Understanding the Perspective of Others" and "Getting the Big Picture" (Table 4.3). These are three of the sections from the framework that were most prominent during this research. Qualitative data are then used to explain the social skill growth for these boys.

Table 4.3: Skills Assessed using SPSS

'Initiation'	'Understanding the Perspective of Others'	'Getting the Big Picture'
Interacts with Peers during Structured Activities	Expresses Sympathy for Others	Maintains the 'Give-and-Take' of Conversations
Interacts with Peers during Unstructured Activities'	Talks About or Acknowledges the Interests of Others	Considers Multiple Viewpoints
Joins in Activities with Peers	Considers Multiple Viewpoints	Compromises during Arguments
	Offers Assistance to Others	Recognises the Non-Verbal Cues or Body Language

4.3.1.1 Initiation

The first social skill where there was a noted improvement was with respect to initiation of social interaction. This involved the students initiating language or action for interactions or non-routine tasks. Three keys skills relating to initiation were observed during this process; 'Interacts with Peers during Structured Activities', 'Interacts with Peers during Unstructured Activities' and 'Joins in Activities with Peers'. All these skills showed a statistically significant

improvement over the course of the intervention, with all p-values less than 0.05 as can be seen in Table 4.4.

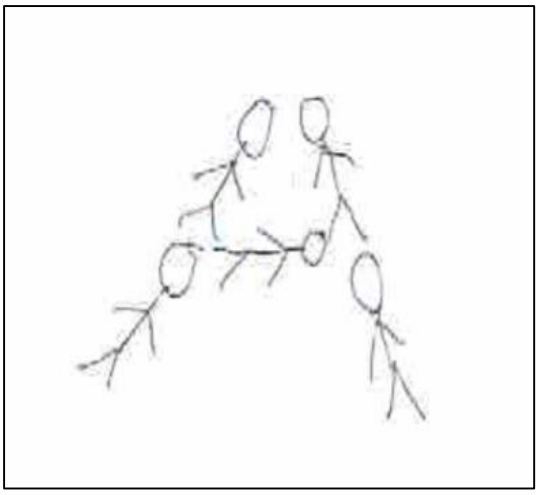
Table 4.4: 'Initiation Improvements Paired T-Test

ASSP Skill		Paired Differences					Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	Interacts with Peers during Structured Activities*	-1.000	.94281	.29814	-1.67444	-.32556	.008
Pair 2	Interacts with Peers during Unstructured Activities*	-1.300	.94868	.30000	-1.97865	-.62135	.002
Pair 3	Joins in Activities with Peers*	-.8000	.42164	.13333	-1.10162	-.49838	.000

* = Indicates a statistically significant change.

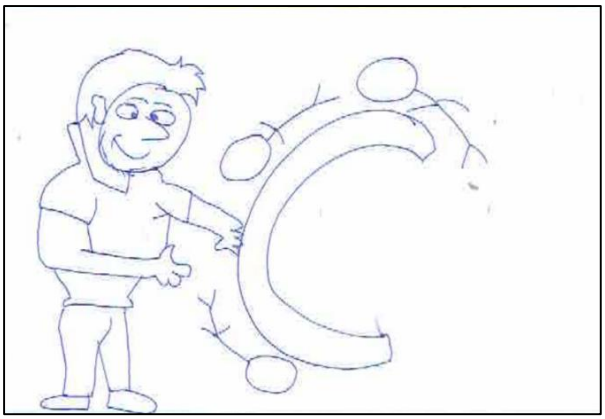
Both qualitative and quantitative data indicate improvements with respect to 'Interacts with Peers during Structured Activities'. It would be expected that these types of interactions would occur in an adventure education setting. Three distinct quantitative results highlight this improvement. The mean difference between pre and post-intervention showed an increase (+1.0) over the period, which was supported by a Hedges G score (1.12) which indicated a large effect size. A paired t-test at a 95% confidence level garnered a statistically significant p-value (0.008). These results indicate an increase in the students' ability to interact during structured activities. These findings can be seen reflected in the qualitative results. Tracy's reflections mention that "*one student asked another student would he like to be his partner during the adventure class. I've never seen the students initiate something like this before. It was really nice to see*" (Year 1, Week 2). Sarah's observations reiterate these interactions when

she explains that *"Fred and Greg were laughing with each other and interacting well during the adventure activity in pairs today"* (Year 2, Week 3). Furthermore, a student picture diary supported the improvement in this skill. In Figure 4.1, students in the drawing were interacting with each other during the activity. In John's reflection he explained, *"we communicated with each other to work out the positioning of the letters and shapes. We took turns giving instructions to the group. It got easier as we practiced more".* Similarly, in Figure 4.2, the students can also be seen working together. Alan's reflection aligned with John, when he explained that *"we created the letter with each other. We had to help each other and ask for advice".*



"We communicated with each other to work out the positioning of the letters and shapes. We took turns giving instructions to the group. It got easier as we practiced more."

Figure 4.2: Student Picture Diary – John Year 2, Week 3



"We created the letter with each other. We had to help each other and ask for advice. Everyone listened to me."

Figure 4.3: Student Picture Diary – Alan Year 2 Week 3

In these entries, the students showed how they interacted positively to complete a task during a specific adventure education lesson.

All data collected also indicated improvements with respect to 'Interacts with Peers during Unstructured Activities'. This would include interactions outside an adventure education setting. The difference between the mean scores indicates that there was an improvement in this skill pre and post intervention (+0.9), resulting in a Hedges G large effect size (1.23). This view was supported in both the teacher reflections and observational log. Sue mentioned in the observation log that *"Brian was friendly with a mainstream student who walked past us. He greeted him and ended the conversation correctly" (*Year 1, Week 3) while Tom observed *"Brian and Edgar initiated a great conversation with each other and the guide and asked appropriate questions"* (Year 2, Week 3). Sally reiterated these musings when she observed "*Edgar asked Conor could he borrow his colouring pencils. Conor agreed and asked if they could be returned after. This was a positive interaction, which normally would result in an argument."* (Year 2, Week 4). Reflections from Tom and Tracy also note the students interacting in unstructured activities. Tom mentions that:

> *The communication activities have definitely helped the students to initiate a conversation with each other at lunchtime and before class. They are interacting with each other more outside the classroom and are doing this in an appropriate manner more frequently than before*. (Year 1, Week 2)

At the same time, Tracy explained that one student "*started to look at me this week when his name was called. This was so strange. Usually, he would say 'what' and continue looking at his feet"* (Year 2, Week 1).

Another skill where improvements were seen was within 'Joins in Activities with Peers'. This skill resulted in a mean improvement (+0.8) over the course of this four-week

programme and acquired a Hedges G score (0.95) relating to a large effect size. Tom reiterated this finding in his reflection when he witnessed *"all students have really improved at including each other in unstructured activities at break and lunch times – like playing basketball."* (Year 1, Week 3).

4.3.1.2 Understanding the Perspective of Others

The second aspect of positive impact of social skill growth was with respect to understanding the perspective of others. This skill involves the ability to interpret the thoughts, beliefs and feelings of others, across a variety of contexts. Four social skill areas were directly related to this area, as indicated in Table 4.3. A paired t-test between the pre-test and post-test results showed that three areas had a statistically significant improvement; "Expresses Sympathy for Others" (0.003), "Talks About or Acknowledges the Interests of Others" (0.010) and "Considers Multiple Viewpoints" (0.037). However, "Offers Assistance to Others" proved to be insignificant with a p-value of 0.193. These results are shown in Table 4.5.

Table 4.5: 'Understanding the Perspective of Others' Improvements Paired T-Test

ASSP Skill		Paired Differences					Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	Expresses Sympathy for Others*	-.8000	.63246	.20000	-1.25243	-.34757	.003
Pair 2	Talks About or Acknowledges the Interests of Others	-.7000	.67495	.21344	-1.18283	-.21717	.010
Pair 3	Considers Multiple Viewpoints*	-.4000	.51640	.16330	-.76941	-.03059	.037
Pair 4	Offers Assistance to Others	-.3000	.67495	.21344	-.78283	.18283	.193

* = Indicates a statistically significant change.

Qualitative data reinforces these results. Tracy noted in her reflection that, during an adventure lesson focusing on teamwork and orienteering, "*one student, who constantly made a clapping noise with his hands, stopped straight away when asked by another member of his group. He apologised for annoying him with the sound.*" (Year 1, Week 4). This was an event that shocked the educational team as they had "*spent the last year asking him to stop making that sound.*" Tracy expanded on this point by explaining that

> "*it is really obvious that the students have learned a great deal about their peers and about how their actions and words affect other people. This is something that definitely has been explored a lot more in the adventure education classes, and it is great to see it influencing their everyday behaviour.*" (Year 1, Week 4).

Sally concurred with this finding in her observational log entry when she mentioned that some students *"explained that they could understand why the new student was nervous today. They said they would've been uncomfortable also."* (Year 2, Week 2)

Tom's reflections also indicated strong signs that the students were beginning to understand the perspective of others. He explained that the students "*showed tremendous encouragement towards a student who was uncomfortable with a hand-holding activity. The student ended up participating and really enjoying the activity. It was nice to see the students caring about the other student's participation.*" (Year 1, Week 4). Sarah's observations aligned with this finding when she mentioned students saying, *"he would be nervous too"* and that *"he felt sorry for him."* (Year 1, Week 4). Similarly, Tracy mentioned in her reflections that *"Fred said that he complimented Alan and David's art work because he knew that they liked getting compliments."* (Year 2, Week 1)

Tracy mentioned in her reflections that the students showed an understanding as to why the timetable had to change. She wrote,

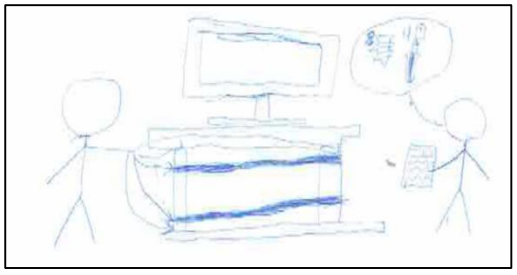
> *The students reacted really well to a change in the timetable today. They asked questions as to why it had to be changed and were a lot more comfortable with it. Usually this would cause a lot of hassle within the group. They usually would not want to discuss why it had to be changed. They began to understand my reasoning for a change occurring.* (Year 2, Week 2)

She also noted that the students complimented each other a lot more. *"I praised him for being kind to his classmates, and he told me that he liked seeing other people smile so he likes to compliment them."* (Year 2, Week 2).

The development of 'Understanding the Perspective of Others' resulted in a 'team mentality' between the participants. This relates to the students beginning to understand and acknowledge their peers, positive interactions with each other becoming more prominent during adventure classes. The student engagement with the adventure activities increased as the classes developed. They began to encourage, motivate and assist each other more frequently and started to exhibit signs that they were becoming a team or unit when completing tasks. Tracy's reflections highlight that the students have *"improved working in groups in all subjects. They listen a lot more to their peers, rather than taking control of situations themselves."* (Year 2, Week 3). The students had begun to move away from completing tasks in isolation, to acknowledging and recognising the importance of teamwork to successfully complete tasks. Sue explained in the observational log that *"the students really enjoyed themselves when they were working together. You can see that they like using their social skills with each other."* Year 2, Week 3). Sally expanded on this point mentioning that *"the students agreed that talking and listening to each other is important, not only for the adventure classes, but in everyday life."* (Year 2, Week 2).

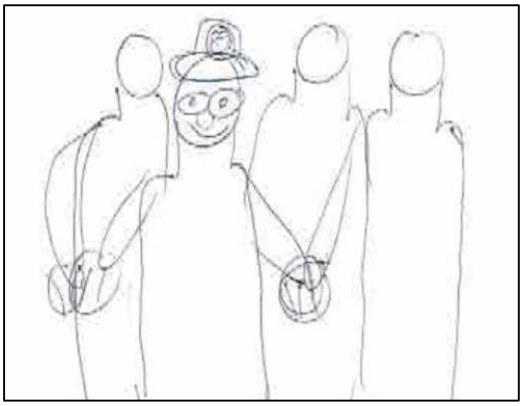
Observational log entries also indicated that the students had begun to complete activities as a group, instead of as isolated individuals. Tracy explained initially that the students would often *"Just sit beside each other in silence"* and *"waited for class by sitting in various parts of the classroom in isolation."* (Year 2, Week 1). However, during this programme, the students did not sit alone outside the classroom. Sue observed that the students *"have started to sit together in the multisensory room"* while Sarah mentioned she overheard them *"talking about the trip from the day before. This would normally not happen."* (Year 1, Week 4).

Sarah also mentioned in the observational log that *"Fred took part in the communication relays today, despite refusing to take part earlier. He said he realised that his team needed him."* (Year 2, Week 1). This group mentality was also reflected in the student picture diaries (see Figure 4.6 and 4.7). In these entries, they demonstrated the group working as a team to complete a task. The reflections use the pronoun "we", showing the students identifying themselves as part of the group or team.



"We worked together to build a TV stand. We talked and listened to each other. We had to read out the instructions, which was hard. I had to encourage people to listen to me. We had to help each other to use the screwdriver."

Figure 4.4: Student Picture Diary – Fred Year 2, Week 3



"We worked together as a team to untangle ourselves. No one got hurt thankfully. We failed bad at first. But we did it and everyone was smiling."

Figure 4.5: Student Picture Diary – Edgar Year 1, Week 4

4.3.1.3 Getting the Big Picture

The final social skill on which this programme had a positive impact was "Getting the Big Picture". This involved the students comprehending underlying concepts and non-verbal cues. There were four social skills that were related to this concept, as indicated in Table 4.3. Quantitative results show that three of these skills had a statistically significant improvement with respect to "Considers Multiply Viewpoints", "Compromises during Disagreements with Others" and "Recognises the Non-Verbal Cues or Body Language" returning a p-value of 0.037, 0.001 and 0.041 respectively. Meanwhile, "Maintains the 'Give-and-Take' of Conversations" proved to be not statistically significant with a score of 0.223. These results are shown in Table 4.6.

Table 4.6: "Getting the Big Picture" Improvements Paired T-Tests

		Paired Differences					Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	Maintains the "Give-and-Take" of Conversations	-.4000	.96609	.30551	-1.09110	.29110	.223
Pair 2	Considers Multiple Viewpoints*	-.4000	.51640	.16330	-.76941	-.03059	.037

Pair 3	Compromises During Disagreements with Others*	-1.200	.78881	.24944	-1.76428	-.63572	.001
Pair 4	Recognises the Non-Verbal Cues or Body Language*	-.5000	.5167	.16330	-.86941	-.03169	.041

* = Indicates a statistically significant change.

The qualitative data reinforces these results, showing students exhibited signs that they were "Getting the Big Picture" in various social situations. Tom reflected that the students:

> *Have started to use a lot more eye-contact and hand gestures when they are talking to you. I think they are mimicking the actions that they used during the non-verbal game. They saw that these are important in everyday communication.* (Year 1, Week 2)

Tracy added,

> S*tudents are doing a lot more listening in group work activities. Usually group work activities would end up as individual activities because they wouldn't have listened. However, this has improved over the last two weeks. They don't always agree, but they will listen to other viewpoints.* (Year 2, Week 2)

The observational logs also indicated that the students have gained a greater understanding of the big picture surrounding the adventure education activities. This understanding led to the students being able to work together to complete problem-based tasks together. Tom mentioned that the students realised they *"were able to complete the activity because they worked together"*, with Tracy also noticing that "*they realised that if they work together, they can complete any task that is given to them."* (Year 2, Week 3). This view was reiterated by Sally who observed that the students *"usually would see these activities as different, unconnected steps, but they realised the link between the map-drawing, directions and the clues which showed they were looking at the overall aim."* (Year 2, Week 3).

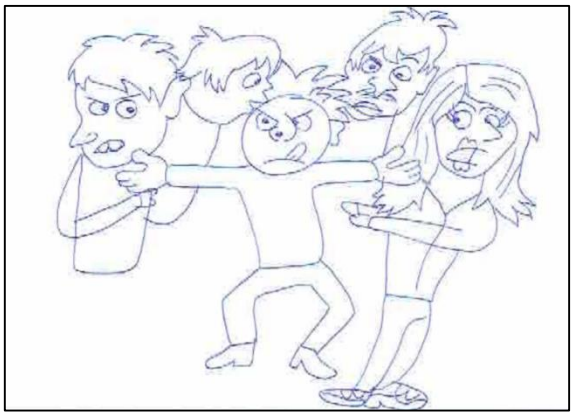
4.3.2 Emotional Development: 'I was also proud of myself'

The second theme was related to the emotional development of all the participants; the students and teachers. While the quantitative findings did not generate data directly related to emotions, a strong sense of the emotions that were developed over the course of the programme was indicated through the teacher reflections and observational log. The first entry to the observational log at the beginning of this study, indicated the negative emotions that existed prior to this programme. Sarah explained that the social skill deficit *"really effects them. They get upset when they are on their own all the time, but do not have the skills to do anything about it."* (Year 1, Week 1)

However, over the course of this programme emotions became more positive. The main emotion that appeared was pride. Alan, in the student picture diary (see Figure 4.4), explained that the task *"was kinda frustrating but funny. I was also proud of myself."* This pride was also evident during the kayaking activity. Tom explained in his reflections that *"the students were nervous before the activity. However, they were so happy afterwards when they had it completed. You could see from their faces that they felt like they had accomplished something."* (Year 2, Week 2). Similarly, the students also conveyed their pride to Tracy. She reflected that *"it was great to hear the students say that they were proud in completing a task today. They realised they worked together and were happy with their work. I was proud too"* (Year 2, Week 3). In her reflection, the students' expressed pride in the completion of their task, but also the teacher's pride in seeing her students successfully complete a task was also evident. In fact, Sue wrote in the observational log that at the end of the programme *"the principal said that she was proud of their accomplishments and participation during the programme."* (Year 2, Week 4).

Furthermore, focusing on the student drawing, it is clear that there was a change in the students' emotions over the course of programme. In his initial drawing, Alan's picture diary

entry conveyed angry, frustrated, annoyed faces of individuals who don't seem comfortable engaging in the adventure activities, as can be seen in Figure 4.6. However, the second picture conveys different emotions, shown in Figure 4.3. The drawing indicates a student who is smiling while instructing the group. The student is content, comfortable and looks like he is enjoying the adventure activity.



"We held each other's arms and talked to each other. It was kinda frustrating but funny. I was also proud of myself."

Figure 4.6: Student Picture Diary – Alan Year 1 Week 1

4.3.3 Transferability of Social Skills: 'A Significant Amount of Coaxing'

The third theme was related to the transfer of skills learned from physical education to another setting outside of physical education. Three skills that are related to the transferability of social performance were analysed using SPSS. Only one of these skills, "Interacts with Peers during Unstructured Activities" obtained a significant improvement between pre- and post-test scores with a p-value of 0.001. "Responds to the Greetings of Others" (0.168) and "Introduces Self to Others" (0.104) proved statistically insignificant. These results can be seen in Table 4.7.

Table 4.7: 'Transferable Social Skills' Improvements Paired T-Tests

ASSP Skill	Paired Differences					Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
				Lower	Upper	

Pair 1	Interacts with Peers during Unstructured Activities*	-.9000	.56765	.17951	-1.30607	-.49393	.001
Pair 2	Responds to the Greetings of Others	-.2000	.42164	.13333	-.50162	.10162	.168
Pair 3	Introduces Self to Others	-.4000	.69921	.22111	-.90018	.10018	.104

* = Indicates a statistically significant change.

While quantitative results indicate conflicting significance levels, qualitative results support and strengthen the evidence that showed the improvements made in the adventure classes had transferred to other contexts. In fact, the improvements in 'initiation' and 'understanding the perspectives of others' could easily be seen transferred to a variety of aspects of the students' everyday life.

Tracy explained in her reflections that the students "*began to show an understanding of the feelings of others."* (Year 1, Week 3). This same point arose in the observational log when Sarah observed that the students *"showed compassion towards a student who was upset that his mother was in hospital. They all gathered around him and were really supportive. This was so unusual, as usually these students would avoid these emotional situations.*" (Year 1, Week 3). Similarly, Sarah mentioned in her observational log that, while shopping for cooking ingredients, the students *"realised that just because they liked it, doesn't mean the others will."* (Year 1, Week 2) While Sue witnessed *"Fred and John were reassuring Conor today and encouraged him not to be nervous before his musical performance."* (Year 2, Week 4). While these examples show an understanding of the people around them, they all show the students using their social skills outside of an adventure education setting. The students are showing that they are able to transfer their learning of understanding the perspective of others, to a situation outside of adventure education.

Similarly, during the week, the teachers decided to bring the group for a nature walk due to the nice weather. Tom commented in his reflection that *"the students would not be comfortable with changes during the day, as it would be diverging from the timetable."* (Year 1, Week 1). However, once the teacher explained the logic behind the change, all students were fine. Tracy reflected that she "*could not believe that there weren't more problems with the change in timetable. Usually, there would have to be a significant amount of coaxing. This was really positive.*" (Year 1, Week 1). Over the four-week programme, the students were able to acknowledge the perspectives of others, outside of their adventure education classes – including their other class teachers.

Equally, on our penultimate trip, the students went on a guided tour of a local, historic village. The students showed a high level of initiation skills, asking questions and speaking with the tour guide effectively and at appropriate times. Tom explained, "*all the students displayed good initiation skills when conversing with the tour guide. They showed that they are learning how to approach and begin a social interaction with another individual*." (Year 1, Week 3).

4.4 Adventure Education: 'A lot better than the groupwork'

The fourth major theme of the study was the use of adventure education, and the benefits of using such a teaching strategy. During this programme, the students experienced adventure education instead of their routine social skill programme. This was the first time that the students would have experienced adventure education (as it was not taught in their physical education programme). It was also the first time that the teachers were able to see the students involved in experiential learning activities. Initially, Tracy explained:

> *We have looked at so many social programmes that might help the boys. We have even purchased 3 or 4 different programmes over the last few years. They all follow the same*

> *pattern and try to get the students to learn routine social skills, such as making phone calls or booking an appointment. While they have learned how to do this, they still were not interacting with each other socially*. (Year 1, Week 1).

In addition, observations and reflections showed that the students were really benefiting from their involvement in experiential learning activities. Tom mentioned in his reflections that the adventure activities forced students to "*make connections between the activity they are involved in and the people around them*" (Year 1, Week 2). Sarah supported this view in her observation when she noted that the students were "*not just focusing on the end goal, and their own performance. They were starting to think about the process and how to work together to get to the solution"* (Year 1, Week 2). Tracy supported these views in her reflections (Year 2, Week 3), she explained:

> *The students are beginning to really consider the different relationships and interactions that exist during the adventure activities. It is clear the students are not only focused on student-task, but on student-student and student-teacher relationships. This is what we have been failing to do previously, get them to acknowledge each other!"*

Reflections and observations also indicated that the students were reaping the benefits from being involved in the adventure education programme. Sue mentioned in the observational log that she noticed the students *"making a great effort socially. They learned a lot during the discussion that took place during the adventure education debrief."* (Year 1, Week 2). Tracy supported this view in her reflections where she asserted, *"... the adventure classes definitely helped to bring on the boys' social skills and teamwork."* (Year 1, Week 4). She noticed that the students "*worked really well in the small groups during adventure classes. This was a lot better than the group work in the normal classroom."* (Year 1, Week 4).

However, Tom and Tracy both commented on the noticeable differences in the students' interactions because of adventure education with Tracy reflecting that *"it was really surprising to see the students interact with each other so positively today during the communication activities. Some of them showed levels of communication that I have not seen before in our regular social education classes, or indeed any other class."* (Year 1, Week 1) Adventure education allowed the students to see the importance of communication and working together. Tom asserted that *"it was really obvious that the students could see the importance of interacting with each other. They have learned from the previous adventure education classes that communication and co-operation are essential to complete the task."* (Year 1, Week 2).

4.6 Summary of Findings

- Adventure education classes helped foster and develop social skill interaction between the students.
- The social skills of "Initiation", "Understanding the Perspective of Others" and "Getting the Big Picture" were positively influenced.
- The students were able to show a transfer between the skills learned in adventure education to situations outside the physical education classroom.
- The group of students developed a team-like bond from engaging in the adventure education programme.
- The students enjoyed working together and communicating with one another. They showed great pride in being able to use their social skills effectively to complete tasks.
- The students showed they realised the importance of using social skills, particularly through their diary.
- The SEN staff are very supportive of adventure education and can see the benefits it is having on the students.

- The Student Picture Diary indicated that students have developed an understanding and awareness for the importance of social skills.

Chapter 5 – Discussion

5.1 Introduction

This chapter discusses and interprets the results from Chapter 4 of this research. The discussion is presented using the research questions that guided the study. Comparisons will be made between several papers which relate closely to this area. Furthermore, other links will be drawn from the literature as discussed in Chapter 2.

5.2 Research Questions

1. What areas of social thinking are most enhanced through involvement in adventure education?
2. How can adventure education foster social skill development in students with ASD?

5.3 What areas of social thinking are most enhanced through involvements in adventure education?

For clarity and coherence purposes, the findings relating to social skill improvements shown over the course of the programme will be looked at first. These improvements will then be supported through the specific examples from three key social skill areas; “Initiation of Social Interaction”, “Understanding the Perspective of Others” and “Getting the Big Picture”. In addition, how these skills were transferred to other settings will be discussed.

5.3.1 Social Skill Improvements

The main purpose of this research was to investigate if the implementation of adventure education could foster social skill development in students with ASD. Taking a broad look at the literature and the results, it was evident that adventure education could help foster social development in these students. In this study, social behaviours improved between pre-intervention and post-intervention. The teachers commented that the adventure education

classes helped to develop the students' social skills and teamwork. They mention that the students were learning from one adventure class to the next. Tracy who teaches the students social skills during the normal school year mentioned that the students showed levels of communication that were not displayed during the regular school year. In fact, she mentioned that she was surprised with the improvements that were being shown during these classes. This was a significant statement, as it shows that the adventure education programme was targeting social skills in a way that the mainstream social education programmes were not. These major skill improvements are mirrored in the analysis of the quantitative data. Fourteen skills showed an improvement between pre-intervention and post-intervention data (Table 4.2). This demonstrated the positive influence adventure education had on the social behaviours of the students within this time.

These results are similar to previous research carried out surrounding adventure education and social skill development. Ewert (1989) found adventure experiences that force students to encounter and endure emotional, physical and social challenge have a positive influence on their interpersonal and intrapersonal development. Priest and Gass (1997) supported these findings showing the positive impact adventure education has on the affective domain of participants; through intrapersonal development and interpersonal development. Finally, Garst, Schneidar and Baker (2001) also indicate that an outdoor adventure programme resulted in improved social and behavioural development. There is clear evidence here that individuals who participate in adventure education classes can learn important social behaviours. In addition, the results of this study reinforce previous studies on social skill training where students learned a new skill through activities (Tse et al, 2007) in an adventure education environment (Boyd and Ward, 2013).

While these results align with this research, it is important to note that these studies do not focus on social skill development in students with ASD engaging in an adventure education

programme. Therefore, it is important to equate these findings to existing research in this area. Comparing these results to other research carried out on social skill development of individuals with ASD using adventure education however is difficult due to the limited research that currently exists (Zachor et al. 2016). In fact, Sutherland and Stroot (2009; 2010) and Zachor et al. (2016) provide the majority of the research on this topic. Sutherland and Stroot (2009; 2010) found that a potential approach to facilitating social interaction among individuals with ASD is through adventure education programmes. The results of this study found that positive interpersonal and intrapersonal experiences arose from the trip. As such, the results of this study provided the foundation for this current research.

More recent research carried out by Zachor et al. (2016) focused on the use of adventure education to reduce ASD symptoms over a 12-week period. Analysis of the data was comparable to this study, with a paired t-test indicating statistically significant p-values relating to Social Cognition, Social Communication, and Social Motivation. These showed that adventure education had a positive impact on improving social behaviours amongst this population. These results align with the quantitative data in this current study, where social skill improvements were seen across a range of skills; such as "Interacts with Peers during Structured Activities", "Interacts with Peers during Unstructured Activities and "Experiences Positive Peer Interactions", as well as improvements seen in the areas of 'Initiation', 'Getting the Big Picture', and 'Understanding the Perspective of Others'.

Nevertheless, while the positive results of this study do correspond with existing research in this area, questions still arise as to the long-term success of the intervention. Matson et al. (2007) assert that interventions often show less consistent results over long periods of time. They found that initial improvements were expected, but the longevity of the improvement was not always maintained. This would be a concern for existing research on the influence of adventure education on social skill development as current research focuses on a

short-term period; for example, Sutherland and Stroot (2010) – 3 days, Zachor et al. (2016) 12 weeks, and this current research – 4 weeks, over 2 years.

Overall, social skill improvements in this current study are overwhelming positive surrounding the relationship between adventure education and social skill development for students with ASD. However, it is imperative that research targets this area to determine the lasting effectiveness of using this curricular model.

5.3.2 Initiation

In Chapter 4, it was shown that skills relating to the 'Initiation of Social Interaction' had increased over the course of the 4-week programme. Initiation skills are of the utmost importance as this is one of the main ways in which social communication can begin. Winner (2014) explained that individuals with ASD find it difficult to initiate an action considered not part of their routine. She explained this could include a difficulty in asking peers to join an activity or entering a peer group. However, in this study, initiation skills showed to gain a statistically significant improvement. These are significant increases over a 4-week timespan, especially given that social initiations are considered to be quite advanced and the key in unlocking positive social experiences (Lopata et al. 2008). While they were significant, they concur with previous research carried out by Sutherland and Stroot (2009) who explained that their participant experienced an increase in interactions with his peers.

These results were expected given the current literature surrounding participation in adventure education. Historically, adventure education has been shown to have a positive influence on interpersonal development (Ewert, 1989). This statement aligns with the current findings where definite improvements were seen in the students' ability to initiate conversations with each other. These skills are all linked to the concept of social initiation and being able to appropriately initiate communication with individuals around them. In fact, the

Junior Cycle adventure education programme indicates that adventure education should help develop and foster these key skills of communication, co-operation, trust, and teamwork in a group setting (DES, 2002).

However, these improvements may not be solely due to the adventure education curriculum students experienced. Lopata et al. (2008) explained that interacting with unfamiliar peers and leaders at the beginning of interventions is stressful and anxiety-provoking. However, this improves over the course of the intervention as students become more comfortable with their surroundings. While this point needs to be considered, the students were familiar with their classmates and most of the educational staff prior to the programme. Therefore, the same stress should not have existed. In Chapter 4, it was mentioned that the students were displaying levels of initiation not normally experienced during a routine school year. This shows that despite the intervention type nature of the programme, the students were still performing above expectations with regard to the initiation of social skills. It is clear that students developed an increased understanding and ability relating to the skills of 'Initiation' during the programme.

5.3.3 Understanding the Perspective of Others

The results of this study also indicated an increase in the student's ability with respect to 'Understanding the Perspective of Others'. Winner (2014) explained that individuals with ASD have difficulty interpreting the perspective, beliefs or feelings of others. She explains in her framework that individuals with ASD are often highly aware of their own perspective but struggle to see the point of view of others. This struggle is directly related to the deficits experienced through 'theory of mind', where the students have a difficulty attributing mental states to others. This includes the ability to understand the thoughts, feelings, and perspectives of those around them. However, results show that these skills were improved over the course of this programme.

Three skills relating to this domain showed a significant level of improvement; 'Expresses Sympathy for Others', 'Talks about or Acknowledges the Interests of Others', and 'Considers Multiple Viewpoints'. These improvements were supported by the qualitative data which gave examples of students supporting and understanding the perspective of their teachers and peers. These themes are supported in the research carried out by Boyd and Ward (2013). They found that students developed a greater understanding of the individuals around them and how their actions may affect others. This was highlighted in their results where specific skills such as 'Offers Comfort when Sad' and "Is Aware of What Others are Thinking or Feeling" showed an improvement from 'Sometimes True' to 'Often True' after participating in a social skills group programme. In their conclusion, they noted a vast improvement in the students' ability to consider the perspective of others.

Similarly, adventure activities and experiential education help students gain an understanding and appreciation of others and the natural environment (DES, 2002). Research on adventure education has shown that individuals involved in this curricular model experience a shared responsibility of learning and problem solving, allowing for an increased understanding of the people around them (Ray, 2002; Steffan and Stiehl, 2010). This, in part, could also explain the positive improvements participants demonstrate in relation to 'Understanding the Perspective of Others'. The link between adventure education and the development of an understanding of the perspective of others is clear when viewed in this context.

5.3.4 Getting the Big Picture

Findings of this research found that improvements were seen with respect to students 'Getting the Big Picture'. This skill consists of improvements with respect to understanding the underlying concepts being discussed, as well as identifying specific details that are being shared (Happé and Frith, 2006). The quantitative results of this study have shown

improvements surrounding a range of skills related to 'Getting the Big Picture'. The skills of "Compromises during Disagreements with Others", "Considers Multiple Viewpoints", and "Recognises the Non-Verbal Cues or Body Language" all showed a statistically significant increase over the four-week period. This is an extremely positive result given that deficits in social reciprocity and non-verbal communicative behaviours are a main deficit experienced by this population (APA, 2013).

These improvements directly relate to the deficits experienced by a student as a result of 'Theory of Mind'. This theory includes an inability to synthesise fragments of information into meaningful wholes (Frith, 1989), or articulate a complete understanding of a particular situation. Qualitatively, improvements were found in the students' ability to acknowledge peers who were upset or uncomfortable in a variety of settings, depending on their circumstances. These improvements aligned with the improvements mentioned by Boyd and Ward (2013). They highlighted that participants showed improved behaviour in the prompt 'Takes Things too Literally and Doesn't Get Real Meaning'. This collection of results indicates a positive increase in the individual's conceptual understanding in specific situations as they relate to 'Getting the Big Picture'.

5.3.5 Specific Social Skill Improvements

In this study, it was hoped that specific social skills improved as a result of adventure education could be identified. In the analysis phase of this research, three main skills were prominent – 'Initiation', 'Understanding the Perspective of Others' and 'Getting the Big Picture'. While the findings support the increased improvements in these skills, it is difficult to compare these results to others in the field due to the lack of research focusing on the specific social skills improvement, with the exception of Boyd and Ward (2013). Therefore, it is a recommendation that future research consider a deeper analysis of social skill development, in terms of the specific skills under investigation.

5.3.6 Transferability of Social Skills

Transfer is represented as "the process of integrating elements of one learning environment into another" (Gass and Priest, 1993, p.18). It is when students learn a task or a skill in one context and can perform a similar task or skill in a different context. The transfer of social skills learned is a critical aspect of any social skill programme, with Gresham et al. (2001) stating that a persistent weakness in social skill training research is its failure to demonstrate transferable results.

From the results of this study, one can see that the students did show they could transfer their social skills to a variety of contexts, outside of the physical education setting. There was definitely strong evidence gathered, highlighting the student's transferal of social skills to contexts such as the classroom, break time, and during class trips. For example, the students showed they could understand the perspective of the teacher when she changed the timetable. In fact, the teacher was surprised that the students were understanding with the changes made. This example demonstrated the students beginning to understand the perspectives of others in the classroom as they were willing to accept the change in the timetable after hearing the reasoning why it needed to happen. The students began to understand where the teacher was coming from instead of thinking about themselves. Similarly, the students showed they could initiate a positive social interaction when they interacted with, and spoke to, the tour guide during one of the class trips. This highlighted the transferral of the initiation and understanding skills to a context outside of the physical education and the school in general.

Furthermore, quantitative results showed the students' skills with respect to 'Interacts with Peers during Unstructured Activities' and 'Interacts with peers during Structured Activities' had a statistically significant increase. While interacting in structured activities might have been expected, especially within the adventure education classes, the improvement in unstructured activities showed that improvements were transferred outside the physical

education setting. In fact, the improvement in 'Interacts with Peers during Unstructured Activities' also resulted in a large effect size. This large effect size means that there was a large increase between the pre- and post-test scores with relation to this skill. This result supports the findings of Boyd and Ward (2013) who also observed an increase in unstructured activities. The qualitative findings provide additional support of this, showing the students interacting with their peers at lunch and with tour guides while on trips. These results align with previous research focused on adventure education, where evidence of successful transferal from adventure education to other areas, in terms of social and personal skills learned, was found (Brown, 2012). Tse et al. (2007) also noted in their study through parent-reports the degree to which social skills learned were generalised to settings outside the treatment sessions. This is an important result as the success of a social skill programme is often based on its ability to generalise any results to a variety of settings (Zachor et al. 2016).

However, these results are contradicting when compared with previous research on social skill interventions for students with ASD. Sutherland and Stroot (2009) on their isolated three-day trip found transfer did not occur. Likewise, Sargent, Perner and Cook (2012) reported that individuals with ASD "failed to generalise the skills learned" (2012, p.63) to other contexts during various social skill interventions. In their study, while initial improvements were seen over the course of their programme, parent reports and follow-up visits showed the improvements made had not transferred as effectively to other contexts. However, in their discussion they described two key characteristics of successful transfer that would allow individuals with ASD to use their learned social skills in other situations. These were if the skills were taught in a real-life situation or activity and if all school personal were involved in the development of the social skills during the school day. These two characteristics were achieved in this study with the students experiencing the social skills in an outdoor adventure setting as the entire educational team (teachers and SNAs) were involved in the process of the

social skills being learned. This may be a reason why adventure education can be seen as an efficient, productive method of teaching social skills, as it can satisfy these criteria.

The idea that the social skills learned in this programme could be transferred to another setting is an extremely important result as it includes a dimension which may have been missing from previous studies (Ewert, 1989; Sutherland and Stroot, 2010, Zachor et al. 2016). In these studies, data were collected through isolated activities such as classroom activities or on a specific trip. This means that observation from a variety of contexts may have been missing. Conversely, while there is evidence that social skills learned were transferred to a variety of settings, it must be noted that this may not be solely due to the effects of the adventure education programme. Lopata et al. (2008) explained that social behaviour improves over the course of the intervention as students become more comfortable with their surroundings. While this needs to be acknowledged, it is important to note that all participants in this study were familiar with the other students and staff prior to the intervention period, meaning this should not have a significant effect on the results.

Overall, this research shows positive results in relation to the fact that social skills learned in adventure education can be successfully transferred to other contexts. However, it would be important to look at a long-term analysis of student performance to see if these improved social skills continued outside of a school setting.

5.4 How can adventure education foster social skill development in students with ASD?

To explain how adventure education could help foster social skill growth in students with ASD, the programme will be looked at through four lenses; experiential learning theory, theory of mind, student voice and teacher comments.

5.4.1 Experiential Learning Theory

Experiential learning theory is useful in understanding the social skill improvements that were made over the course of this programme. Adventure education aligns with the model of experiential learning which defines learning as knowledge created through experience (Kolb, 1984). The students in this study appeared to create both a knowledge and an understanding of various social behaviours through the engagement with an adventure education programme. The fact that the students developed specific social skills show that that they have started to learn how to apply what was learned in the adventure classes. This aligns with the final stage of the experiential learning cycle, where are actively experimenting and implementing the skills that they have learned in the adventure education classes (Kolb and Kolb, 2011). In fact, it was clear that the students were beginning to use the skills that they learned during the adventure education classes to other settings, such as lunchtime activities and school tours.

Earlier in this chapter, it was discussed that the SEN teacher struggled to find a social skill programme that effectively targeted the needs of the students. Despite the vast amount of programmes and interventions that they tried, the students were still not interacting with each other socially. Previous social skill programmes that they used, focused on the students learning and practicing a routine skill like making an appointment or making a phone call. The findings of this study indicate that maybe what was missing from previous social skill programmes was the opportunity to engage in the experiential learning cycle. Kolb (2011) maintained that students create their own understanding of a desired skill or action through experience. They need to be able to apply what they are learning, in order for them to remember it (Dart et al. 2000). The fact that the participants had their own opportunity to reflect through the student picture diary reinforced the learning that was taking place. Adventure education is the ideal model to experience the experiential learning theory, due to the fact they are merging with key concepts central to both (Prouty et al., 2007).

Therefore, the success of this programme in developing social skills in students with ASD could be contributed to the adventure education model itself, and how it embeds the experiential learning theory.

5.4.2 Theory of Mind

At the beginning of this research, theory of mind was one of the potential theories used to explain the social skill deficits that individuals with ASD experience. This theory indicates that individuals with ASD have difficulty processing and interpreting social situations (Mitchell, 1997). The main difficulty associated with 'theory of mind' is relating to a difficulty understanding the perspective of others.

Theory of mind is one of the most researched theories relating to the social skill impairment experienced by individuals with ASD (Happé, 2000). The findings of this study indicate that the use of adventure education can help specifically target this difficulty, as students' ability to understand the perspective of others improved during the programme. Students showed throughout the programme that they were developing a greater understanding of the people around them; their peers, the teachers and decisions taken during the day. The adventure education classes forced the students to work together and acknowledge their peers. They needed to listen to their views, opinions and feedback in order for the successful completion of the adventure tasks. In this way, the adventure activities targeted the students 'Theory of Mind' deficits directly. Therefore, it is important for researchers to continue to investigate the use of adventure education as a means of targeting and improving this particular social skill deficit.

5.4.3 Examples of Student Voice

In this study, most data are focused on observed behaviour as it was being performed. However, Di Carlo et al. (2000) explains that testing often fails to adequately recognise the strengths and

weaknesses of those with literacy or communicative difficulties. This is especially true when focusing on this population. The student picture diary gave the students an opportunity to highlight their perception of the adventure education classes that were taking place, and how exactly the classes were targeting their social skill deficits.

Figure 5.1: Student Picture Diary – Alan Year 1, Week 1 vs Alan Year 2, Week 3

These are two pictures that were drawn by the same student (Alan). In both these photos, the student has acknowledged that the group are working together. However, what is significant about these two pictures is the difference in the emotion that is being displayed. The first picture is quite negative, with the second picture indicating a shift in perspective. The students began to enjoy and become more confident in their ability to work together. This remark was reflected in the qualitative data where the educational team mentioned that the students worked well together and showed pride in the completion of various tasks. This comparison showed the change students experienced during this programme. Their perspective towards social skills and adventure education shifted from a negative to a positive outlook. This also compliments research on student drawings which suggest that using drawings allowed researchers to capture underlying emotions of participants and see how these emotions were changing (Vince, 1995).

These changing emotions aided the social skill development that was taking place. The drawings show that the students were becoming comfortable in the adventure education classes, and gradually becoming more comfortable in performing social skills in the group. Student reflections supported this finding. John mentioned that the tasks got easier as they instructed, listened and practiced. The students were really understanding the importance of developing and using their social skills.

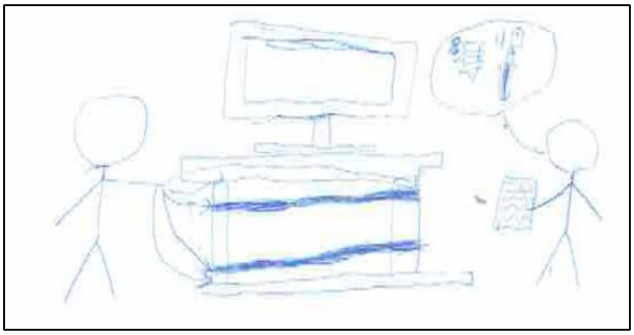


Figure 5.2: Student Picture Diary – Fred Year 2, Week 3

The student picture diary often showed the students demonstrating the finished product or result following the adventure lesson. They realised the goal and were proud when they achieved it. In Figure 5.2, the student is showing the completed television stand. This was a culminating activity to reinforce the learning that took place in previous activities, where the students practiced effective communication and co-operation skills – both speaking and listening. This activity was probably one of the most challenging, as the students had to take turns giving instructions from the manual, as well as giving feedback to each other. Matthews (2012) explains, drawing allows the students to represent their own experiences in a way that is suitable to them and allows us access to it. In his reflection, Fred commented that he worked with his team, encouraging and helping his peers. These are all skills related to social behaviour. Like the qualitative data, these pictures also reinforced the positive improvement on social skill behaviours that were experienced over the course of the adventure education programme.

5.4.4 Teacher Comments

In this programme, Tracy was the teacher who normally taught social skills to this group of students. As previously mentioned, she commented on her struggle to find a programme that adequately met the needs of the students in the class. This is a common problem in the education of individuals with ASD, due to the broad, spectrum-like nature of the disorder. McMahon, Vismara and Solomon (2013) maintained that teachers need to have as many social skill interventions as possible in order to address the unique needs of the individuals in the group. The teacher fully supported adventure education as one of these possible interventions. In fact, she showed that she really valued the student's involvement in the adventure education classes. The students were displaying a level of communication and teamwork that she did not usually see in her routine social education classes or SEN classes. These comments from the teacher show that the adventure education model is useful in developing the social skills that the students really need.

The SEN teacher was very devoted to the growth and development of the students. In fact, the enthusiasm that the teacher has in achieving real improvements in her class was experienced many times throughout the study. In one particular comment, she mentioned how proud she was of the improvements and achievements the students were obtaining in adventure education. This point shows the importance of social skill interventions for these students. Everyone that is involved with them – family, friends and teachers, are striving for an improvement in this area.

5.5 Conclusion

The aim of this study was to investigate the impact of adventure education on the social skill development of students with ASD. The exact social skills developed and the transferability of these learned skills to situations other than the physical education class was also explored. Initial results reinforced the social skill deficits that exist within the ASD population. The

findings suggest adventure education has had a positive impact on the social behaviours of students with ASD. While most of the improvements were seen in the adventure education class during activities, improvements were also seen across a variety of settings – outside the physical education class. Furthermore, the social skills of 'Initiation', 'Understanding the Perspective of Others' and 'Getting the Big Picture' showed major improvements between pre- and post-intervention data. As well as this, student voice data indicated that students showed increased enjoyment and understanding towards the concept of social cognition. The impact of these improvements allowed the students to achieve above-expectation outcomes in the adventure education lessons, allowing them to continue to challenge themselves with more difficult activities. It also allowed the students to recognise the importance of positive social behaviours.

Adventure education as a possible social skill intervention was fully supported by the educational staff. Tracy, who would normally teach social skills to the students, was fully supportive of the programme. She commented that she could see the benefits it was having on the students and stated that she would support the students undertaking the programme on a longer time-scale.

Chapter 6 – Conclusion

6.1 Introduction

The purpose of this study was to investigate the impact of adventure education on the social skill development of students with ASD.. The next section of this paper provides a summary of the main findings of this study. This summary shows how effective the study was in achieving its objectives. Also, in section 6.4 key recommendations of this study are highlighted. Finally, in section 6.5, considering the relevant achievements and limitations of this study, the researcher has outlined some suggestions for future research.

6.2 Summary of Findings

The research questions helped to guide the development and analysis of this study, and thus will now be used to shape the conclusion. These research questions were:

1. What areas of social thinking are most enhanced through involvement in adventure education?
2. How can adventure education foster social skill development in students with ASD?

6.2.2 What areas of social thinking are most enhanced through involvement in adventure education?

It was clear that students' social skill ability improved over the course of the programme. Taking a closer look at this data showed that three skills in particular displayed the greatest positive change in behaviour between pre and post-intervention data. These were the skills of *Initiation, Understanding the Perspective of Others* and *Getting the Big Picture*. These skills have a foundation in adventure education, and therefore, it was no surprise that they developed over the course of the programme. Zachor et al. (2016) found similar skill improvements in his study involving adventure education intervention methods. However, most literature appeared to only focus on the broad concept of social communication, social behaviour or social

cognition, instead of the exact improvements that were made. This means it was difficult to fully compare these improvements to similar studies. It is recommended that further research be undertaken in the area of social cognition in order to gain an understanding of the exact skills most improved due to adventure education.

In addition, research showed that skills that were developed were transferred to a variety of settings outside of the adventure education class. While these findings were overwhelmingly positive, there was mixed support for these results from the literature. Research tended to contradict the transferability of learned social skills, these did not relate to skills learned in response to an adventure education programme. Therefore, it is suggested that more research be carried out to gain a complete understanding on whether these skills learned, are maintained and transferred outside of the adventure classes.

6.2.1 How can adventure education foster social skill development in students with ASD?

Before carrying out this research, my co-teachers and I believed there was a very low level of social skills amongst the students. The initial findings of this study were consistent with this belief and highlighted the negative impact this had on their lives. However, from analysis of the qualitative and quantitative data, it is clear that there was an improvement in the students 'social skills over the course of the programme. In fact, qualitative results show that the students began to develop an understanding surrounding the importance of social cognition and why it was important. The adventure education model, through the experiential learning theory, where the students are applying and reflecting their learning, has had a significant influence on the positive findings.

6.3 Social Skill Interventions

At the beginning of this research, I held the view that we would be able to find a suitable intervention for students with ASD. While adventure education has proven to have a positive

influence on the social skill development of students with ASD, questions are still raised as to whether maintenance and transferability of social skills are satisfied by this method of intervention.

However, it has become apparent there may be no exact solution to the social skill problem that exists (McMahon et. al, 2013). The fact individuals with ASD have a wide array of abilities, and the vague concept of social cognition means it is difficult to accurately identify a single method that would satisfy all needs. It seems as though what is needed are multiple solutions to address the many needs and dimensions of both the disorder (ASD) and the concept (social cognition).

6.4 Recommendations

From this study, several recommendations might be considered. These recommendations have been summarised into four main points below:

1. Students with ASD should receive individualised, evidence-based physical education targeted to their needs. This physical education should include adventure education.
2. Extra emphasis should be placed on addressing and improving the social skill deficit that individuals with ASD currently struggle with in their lives. This could include analysing potential intervention strategies and the associated benefits of each.
3. Adventure education, as a curricular model, has multiple benefits for all students. Its use should be increased across the educational field; including primary, secondary and special educational schools.
4. Additional research needs to be prioritised in the areas of social skill development in students with ASD. This includes an increase in research in young adults with ASD, with an analysis of social cognition and adventure education as a possible intervention strategy.

5. Physical education and SEN teachers should be encouraged to use non-verbal debriefing strategies when working with individuals with ASD This will allow them to fully understand and evaluate the learning that is taking place.
6. Experiential Learning Theory should be applied to other areas of student learning. The teacher mentioned that she had used many social skill programmes previously. Some of these programmes may have positive benefits if taught using the principles of experiential learning.

6.5 Further Research

There are many more areas of study which can be conducted using the findings of this study. The main recommendation for future research is to expand the current discourse surrounding adventure education and social skill development. This would include research that would examine the maintenance and transferability of skills learned over a period of time. The recommendations for future research on this topic have been summarised into four main points.

1. Investigate the aspects of adventure education which have an impact on the social skill development of students with ASD.
2. Evaluate the effects of a long-term adventure education programme on the social skill development of students with ASD.
3. Investigate the use of social emotional learning to foster positive social behaviours in students with ASD.
4. Investigate the transferability and maintenance of learned social skills in individuals with ASD to settings outside the classroom.

6.6 Final Comment

In conclusion, this study investigated if adventure education can aid the social skill development of students with ASD. The results of this research indicate that there is a positive

relationship between social skill development and adventure education, highlighted through the qualitative and quantitative results. While this supports existing research in the field, Zachor et al. (2016) and Sutherland and Stroot (2009; 2010), it is limited in its findings. In order to strengthen and progress this area, it is imperative that research continues to focus on targeting these deficits and to help find a solution.

Through my work as a physical education teacher with these students, I can see the negative impact social skill deficits have on the lives of individuals with ASD. I am proud of the work that has been done, thus far, to help improve these students. Following the results of this study, students with ASD in this school now receive two periods of individualised, targeted physical education with a qualified physical education teacher. Their physical education programme was created using this research and existing research on motor skill development for this population allowing for a curriculum that effectively targets their social and motor skill deficits.

References

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders, 4th ed*. Washington, DC: American Psychiatric Association Press.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders, 5th ed*. Arlington, VA: American Psychiatric Publishing.

Asperger, H. (1944). 'Autistischen psychopathen'. *Kindesalter. Archiv für Psychiatrie und Nervenkrankheiten,* 117(1): 76–136.

Baguley, T. (2009). 'Standardized or simple effect size: what should be reported?'. *British Journal of Psychology*, 100(3), 603–17.

Baron-Cohen, S. (2000). *Understanding other minds.* Oxford, UK: Oxford University Press.

Baugh, F. (2002). 'Correcting effect sizes for score reliability: a reminder that measurement and substantive issues are linked inextricably'. *Educational and Psychological Measurement*, 62 (2), 254–263.

Bauminger, N. and Kasari, C. (2000). 'Loneliness and friendship in high-functioning children with autism'. *Child Development, 71,* 447–456.

Bell, J. (2010). *Doing your research project: A guide for first time researchers in education, health and social science, 5th ed*. London, UK: Open University Press.

Bellini, S. (2006). *Building social relationships: A systematic approach to teaching social interaction skills to children and adolescents with autism spectrum disorders and other social difficulties*. Shawnee Mission, KS: Autism Asperger Publishing.

Bellini, S. and Hopf, A. (2007). 'The development of the autism social skills profile: Focus on autism and other developmental disabilities'. *Focus on Autism and Other Developmental Disabilities*, 22, 80–87.

Bemporad, J. (1979). 'Adult recollections of a formerly autistic child'. *Journal of Autism and Developmental Disorders*, 9, 179–197.

Berg, K. and Latin, R. (2008). *Essentials of research methods in health, physical education, exercise science and recreation, 3rd ed*. Baltimore, MD: Lippincott, Williams and Wilkins.

Bleuler E. (1911). *Dementia praecox or the group of schizophrenias*. New York: International Universities.

Block, H., Radley, K., Jenson, W., Clark, E. and O'Neill, R. (2015). 'Effects of a multimedia social skills program in increasing social responses and initiations of children with autism spectrum disorder', *International Journal of School & Educational Psychology*, 3(1), 16-24.

Bogdashina, O. (2006). *Theory of mind and the triad of perspectives on autism and asperger syndrome*. Philidelphia, PA: Jessica Kingsley Publishers.

Bond, C., Symes, W. and Hebron, J. (2016). *Educating persons with autistic spectrum disorder – A systematic literature review*. Dublin: National Council for Special Education.

Borton, T. (1970). *Reach, touch and teach*. London: Hutchinson.

Boyd, L. and Ward, D. (2013). 'Social compass curriculum: Three descriptive case studies of social skills outcomes for students with autism'. *SAGE Open*, 4(3), 1–11.

Brown, M. (2012). 'Adventure education: An introduction', *Journal of Adventure Education and Outdoor Learning*, 12:3, 261–264.

Burkitt, E. (2004). 'Drawing conclusions from children's art'. *The Psychologist*, 17, 566 – 568.

Burns, A. (1999). *Collaborative action research for English language teachers*. Cambridge, UK: Cambridge University Press.

Capps, L., Sigman, M. and Yirmiya, N. (1995). 'Self competence and emotional understanding in high functioning children with autism'. *Development and Psychopathology*, 7(1), 137–149.

Carter, E. and Hughes, C. (2007). 'Social interaction interventions: Promoting socially supportive environments and teaching new skills'. In Odam, S., Horner, R., Snell, M. and Blancher, J. (eds.) *Handbook of Developmental Disabilities,* New York: Guilford Press, 310–328.

Centers for Disease Control and Prevention (CDC, 2008). 'Prevalence of autism spectrum disorders - Autism and developmental disabilities monitoring network', 14 sites, United States, 2002'. *Morbidity and Mortality Weekly Report, Surveillance Summaries* 2008: 61 (No. SS-3).

Centers for Disease Control and Prevention (CDC, 2014). 'Prevalence of autism spectrum disorders - autism and developmental disabilities monitoring network'-, 11 sites, United States, 2010'. *Morbidity and Mortality Weekly Report, Surveillance Summaries* 2014: 63 (No. SS-2).

Coghlan, D. (2011). 'Action research: Exploring perspectives on a philosophy of practical knowing'. *Academy of Management Annals*, 5 (1), 53–87.

Cohen J. (1988). *Statistical power analysis for the behavioral sciences*. New York, NY: Routledge Academic.

Cohen J. (1995). 'The earth is round (p<. 05): Rejoinder'. *American Psychologist*, 50, 1103.

Cohen, L. and Mannion, L. (1994). *Research methods in education, 4th ed*., London: Routledge.

Cohen, L., Manion, L. and Morrison, K. (2007). *Research methods in education, 6th ed.*, London: Routledge.

Cooper, K., Smith, L., and Russell, A. (2018). 'Gender identity in autism: Sex differences in social affiliation with gender groups' *Journal of Autism and Developmental Disorders*, 48(12), 3995–4006.

Creswell, J. (2014). *Research design: Qualitative, quantitative and mixed methods approaches*. London: SAGE Publications.

Dart, B., Burnett, P.C., Purdie, N., Boulton-Lewis, G., Campbell, J. and Smith, D. (2000). 'Influences of students' conceptions of learning and the classroom environment on approaches to learning'. *Journal of Educational Research*, 93, 262–272.

David, M. and Sutton, C. (2004). *Social research: The basics*. London: SAGE Publications International.

Denscombe, M. (2007). *The good research guide: For small scale social research projects*. London: Open University Press.

Denzin, N., and Lincoln, Y. (eds.). (2005). *Handbook of qualitative research, 3rd ed*. Thousand Oaks: SAGE Publications.

Department of Education and Skills (2002). *Junior cycle physical education syllabus*. Athlone: DES.

Department of Education and Skills (2014). *Circular 0030/2014: The special needs assistant (SNA) scheme to support teachers in meeting the care needs of some children with special educational needs, arising from a disability*. Athlone: DES.

Department of Health (2018). 'Estimating prevalence of autism spectrum disorder (ASD) in the irish population: A review of data sources and epidemiological studies', available from https://www.gov.ie/en/publication/0cc791-reports-on-the-prevalence-of-autism-in-ireland-and-a-review-of-the-s/?referrer=/wp-content/uploads/2018/12/asd-report-final-19112018-for-publication.pdf/ [accessed on 18th July, 2019].

DeWalt, K. and DeWalt, B. (2002). *Participant observation: A guide for fieldworkers*. Walnut Creek, CA: AltaMira Press.

Dewey, J. (1938). *Experience and education*. New York, USA: Macmillan Company.

DiCarlo, M., Gibbons, J., Kaminsky, D., Wright, J. and Stiles, D. (2000). 'Street children's drawings: Windows into their life circumstances and aspirations'. *International Social Work*, 43, 107–120.

Dick, B. (2002). 'What is action research'. *The Learning Organization*, 9 (4), 159 – 170.

Dobbins, N., Higgins, K., Pierce, T., Tandy, R. and Tincani, M. (2009). 'An analysis of social skills instruction provided in teacher education and in-service training programs for general and special educators', *Remedial and Special Education*. 31(5), 358–367.

Dublin City University (2013) 'Autism counts' – An Irish Autism Action - Funded Research, available: http://www4.dcu.ie/marketing/staffnews/2013/jul/irishautism.shtml [accessed 14th August 2018].

Elliot, S. and Gresham, F. (1987). 'Children's social skills: Assessment and classification practices'. *Journal of Counselling and Development*, 66, 96-99.

Elliott, J. (1991). *Action research for educational change*. Milton Keynes, UK: Open University Press.

Ewert, A. (1989). *Outdoor adventure pursuits: Foundations, models, and theories*. Columbus, OH: Horizons.

Fan, X. (2001). 'Statistical significance and effect size in education research: Two sides of a coin'. *The Journal of Educational Research*, 94(5), 275 – 282.

Farnham, M., and Mutrie, N. (1997). 'The potential benefits of outdoor development for children with special needs', *British Journal of Special Education*, 24(1), 31-37.

Finger, S. and Rand, K. (2003). "Addressing validity concerns in clinical psychology research" in Roberts, M. and Ilardi, S. (eds.), *Handbook of Research Methods in Clinical Psychology*. Malden: Blackwell, 13–30.

Folsom, J. and Munson, K. (2006). *An overview of the adventure-based experiential learning process*. Rensselaer, NY: St. Josephs College.

Frith, U. (1989). *Autism: Explaining the enigma.* Oxford: Basil Blackwell.

Frith, U. (1991). *Autism and Asperger syndrome*. Cambridge: Cambridge University Press.

Frith, U. and Frith, C. (2010). 'The social brain: Allowing humans to boldly go where no other species has been'. *Philosophical Transactions of The Royal Society,* 365, 165–175.

Frith, U. and Happé, F. (1994). 'Autism beyond 'theory of mind''. *Cognition,* 50, 115–132.

Garst, B., Schneider, I. and Baker, D. (2001). 'Outdoor adventure program participation impacts on adolescents self perception'. *Journal of Experiential Education*, 24(1), 41–49.

Gass, M. and Priest, S. (1993). 'Using metaphors and isomorphs to transfer learning in adventure education'. *The Journal of Adventure Educaiton and Outdoor Leadership*, 10 (4), 18-23.

Government of Ireland. (2004). *Education for persons with special educational needs (EPSEN) Act 2004,* Dublin: Government Publications.

Government of Ireland (2005). *Disability Act 2005*, Dublin: Government Publications.

Government of Ireland (2018). *Estimating prevalence of autism spectrum disorders (ASD) in the Irish population: A review of data sources and epidemiological studies*. Dublin: Department of Health.

Greene, S. and Hill, M. (2005). 'Researching children's experience: Methods and methodological issues'. In Greene, S. and Hogan, D. (eds.). *Researching Children's Experience*. London: Sage, 1 – 21.

Gresham, F. (1986). 'Conceptual and definitional issues in the assessment of children's social skills: Implications for classification and training'. *Journal of Clinical Child Psychology,* 15(1), 3-15.

Gresham, F. (2002). 'Social skills assessment and instruction for students with emotional and behavioral Disorders'. In Lane, K., Gresham, F. and O'Shaughnessy, T. (eds.), *Interventions for Children with or at Risk for Emotional and Behavioral Disorders.* Boston: Allyn and Bacon, 242–257.

Griffin, S. and Shevlin, M. (2007). *Responding to special educational needs: An Irish perspective.* Dublin: Gill and Macmillian.

Grzadzinski R, Huerta, M. and Lord C. (2013). 'DSM-5 and autism spectrum disorders: An opportunity for identifying ASD subtypes'. *Molecular Autism*, 4, 1–6.

Happé, F. (1995). Autism: An introduction to psychological theory. Cambridge, MA: Harvard University Press.

Happé, F. (2000). 'Parts and wholes, meaning and minds: Central coherence and its relation to theory of mind', in Baron-Cohen, S., Tager-Flusberg, H. and Cohen, D. (eds.). *Understanding Other Minds. Perspectives from Developmental Cognitive Neuroscience.* Oxford: Oxford University Press, 203–221.

Happé, F. and Frith, U. (2006). 'The weak coherence account: Detail focused cognitive style in autism spectrum disorders'. *Journal of Autism and Developmental Disorders, 36* (1), 5-25.

Heale, R. and Forbes, D. (2013). 'Understanding triangulation in research'. *Evidence-Based Nursing,* 16 (4), 98.

Healy, O. and Flynn, L. (2012). 'A review of treatments for deficits in social skills and self-help skills in autism spectrum disorders'. *Research in Autism Spectrum Disorders*, 6(1), 431-441.

Hedges L. and Olkin I. (1985). *statistical methods for meta-analysis*. San Diego, CA: Academic Press.

Hirai, N. (1968). *Childhood autism*. Tokyo: Nihon-Shoni-Iji

Hochhauser, M., Weiss P. and Gal, E. (2015). 'Negotiation strategies of adolescents with high-functioning autism spectrum disorder during social conflicts'. *Research in Autism Spectrum Disorders*, 10, 7–14.

Howlin, P. (2000). 'Outcome in adult life for more able individuals with autism or disorders'. *Journal of the American Academy of Child and Adolescent Psychiatry* 40 (9): 995–996.

Idring, S., Rai, D., Dal, H., Dalman, C., Sturm, H. and Zander, E. (2012). 'Autism spectrum disorders in the stockholm youth cohort: Design, prevalence and validity'. *Public Library of Science ONE*, 7(7).

Johnson, R. and Onwuegbuzie, A. (2004). 'Mixed methods research: A research paradigm whose time has come'. *Educational Researchers*, 33(7), 14-26.

Johnson, B., Onwuegbuzie, J. and Turner, L. (2007). 'Towards a definition of mixed methods research'. *Journal of Mixed Methods*, 1(2), 112-133.

Jolley, R. and Vulic-Prtoric, A. (2001). 'Croatian children's experience of war is not reflected in the size and placement of emotive topics in their drawings'. *British Journal of Clinical Psychology*, 10, 107-110.

Jordan, R. (2010). *Autistic spectrum disorder: An introductory handbook for practitioners*. London: David Fulton Publishers.

Kanner, L. (1943). 'Autistic disturbances of affective contact'. *Nervous Child*, 2, 217–250.

King, N. and Horrocks, C. (2010). *Interviews in qualitative research*. London: SAGE Publications.

Kolb, A. and Kolb, D. (2010), 'Learning to play, playing to learn'. *Journal of Organizational Change Management*, 23(1), 26-50.

Kolb, D. (1984). *Experiential learning experience as the source of learning and development*. Englewood Cliffs, NJ Prentice Hall.

Kokina, A., & Kern, L. (2010). 'Social story interventions for students with autism spectrum disorders: A meta-analysis', *Journal of Autism and Developmental Disorders*, 37, 1803-1814.

Koshy, V. (2005). *Action research for improving practice: A practical guide*. London: Paul Chapman Publishing.

Kuhn R (2004). 'Eugen Bleuler's concepts of psychopathology'. *History of Psychiatry*, 15, 361-366.

Little L. (2001). ‘Peer victimization of children with asperger spectrum disorders’. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 995–996.

Lopata, C., Thomeer, M., Volker, M., Nida, R. and Lee, G. (2008). ‘Effectiveness of a manualized summer social treatment program for high functioning children with autism spectrum disorders’. *Journal of Autism and Developmental Disorders*, 38(5), 890–904.

Lord, C. (2011). ‘How common is autism?’. *Nature*, 474, 166-168.

Lord, C., and McGee, J. P. (2001). *Educating children with autism*. Washington, DC: National Academy Press.

Lord, C., Risi, S., and Pickles, A. (2004). Trajectory of language development in autistic spectrum disorders. In Rice, M. and Warren, S (eds.), *Developmental Language Disorders: From Phenotypes to Etiologies*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, 7 – 29.

Lovaas, O. (1987). ‘Behavioral treatment and normal educational and intellectual functioning in young autistic children’. *Journal of Consulting and Clinical Psychology*, 55, 3-9.

Marshall, C and Rossman, G. (1989). *Designing qualitative research*. Newbury Park, CA: Sage Publications.

Martin, D. (2012). ‘The ever-changing social perception of autism spectrum disorders in the United States’, *Journal of Exploration in Social Sciences*, 1, 1-22.

Marwick, H., Dunlop, A. and MacKay, T. (2005). *Literature review of autism for HM Inspectorate of Education*, Strathclyde: National Centre for Autism Studies.

Matson, J., Matson, M. and Rivet, T. (2007). ‘Social-skills treatments for children with autism spectrum disorders: An averview’. *Behavior Modification, 31*(5), 682-707.

Matthews, M. (2012). 'Changing the focus: From nature of science (NOS) to features of science (FOS)', In Khine, M. (Ed.), *Advances in Nature of Science Research Concepts and Methodologies*, Dordrecht: Springer, 3 – 26.

McBurney, D. and White, T. (2007). *Research methods, 7th ed*. Belmont: Thomson Wadsworth..

McMahon, C., Vismara, L. and Solomon, M. (2013). 'Measuring changes in social behavior during a social skills intervention for higher-functioning children and adolescents with autism spectrum disorder'. *Journal of Autism and Developmental Disorders*, 43(8), 1843–1856.

McNiff, J. (1988). *Action research: Principles and practice, 1st ed.* Basingstoke, UK: Macmillan.

McPartland, J., Reichow, B., and Volkmar, F. (2012). 'Sensitivity and specificity of proposed DSM-5 diagnostic criteria for autism spectrum disorder', *Journal of the American Academy of Child and Adolescent Psychiatry*, 51, 368–383.

Merriam, S. (2009). *Qualitative research: A guide to design and implementation*. San Francisco: Jossey-Bass.

Mertens, D. (1998). *Research methods in education and psychology: Integrating diversity with quantitative and qualitative approaches*. Thousand Oaks, California: Sage Publications.

Miller, L. (2009). *Practical behaviour management solutions for children and teens with autism: The 5P approach*. London: Jessica Kingsley Publishers.

Mitchell, P. (1997). *Introduction to theory of mind: Children, autism and apes.* London: Arnold.

National Council for Curriculum and Assessment (2003). *Junior cycle physical education*. Dublin: Stationary Office.

National Council for Curriculum and Assessment (2016). *Senior cycle physical education framework*. Westmeath: NCCA.

National Council for Curriculum and Assessment (2018). *Delivering for students with additional care needs: The right support at the right time in schools*, Trim, NCSE, available:

https://ncse.ie/wp-content/uploads/2018/05/NCSE-Delivering-Students-Care-WGR02.pdf, [accessed on 17th November 2019].

National Council for Special Education (2015). *For schools: Applications for resources: NCSE Guidelines for 2015/2016 Allocations*, available online http://ncse.ie/for-schools [accessed on 8th July 2017].

National Council for Special Education (2013). *Supporting students with special educational needs in schools*. Trim: NCSE.

Noens, I. and van Berckelaer-Onnes, I. (2005). 'Captured by details: sense-making, language and communication in autism', *Journal of Communication Disorders*, 38, 123– 141.

O'Connell, T., and Dyment, J. (2011). 'The case of reflective journals: Is the jury still out?'. *Reflective Practice*, 12, 47–59.

Priest, S. and Gass, M. (1997). *Effective leadership in adventure programming*. Champaign, IL: Human Kinetics.

Prouty, D. Panicucci, J. and Collinson R. (Eds.) (2007). *Adventure education: Theory and applications*. Beverly, CA: Project Adventure, Inc.

Quirmbach, L., Lincoln, A., Feinberg-Gizzo, M., Ingersoll, B., and Andrews, S. (2008). 'Social stories: Mechanisms of effectiveness in increasing game play skills in children diagnosed with autism spectrum disorder using a pretest posttest repeated measures randomized control group design', *Journal of Autism and Developmental Disorders*, 38(2), 353-361.

Ray, T. (2002). *Principles for adapting activities in recreation programs and settings*. Bloomington, IN: National Center on Accessibility.

Rice, C., Rosanoff, M., Dawson, G., Durkin, M., Croen, L., Singer, A., Yeargin-Allsopp, M. (2012) Evaluating changes in the prevalence of the autism spectrum disorders (ASDs), *Public Health Reviews* 34 (2), 1 – 22.

Rose, S., Spinks, N. and Canhoto, A. (2014). *Management research: Applying the principles*. Routledge: London.

Saldana, J. (2011). *The coding manual for qualitative researchers*. Thousand Oaks: SAGE Publications.

Sargent, L., Perner, D. and Cook, T. (2012). *Social skills for students with autism spectrum disorders and other developmental disabilities, volume 1: Elementary school lesson plans (1-50).* Arlington, VA: Council for Exceptional Children.

Saulnier, C. and Klin, A. (2007). 'Brief report: social and communicative abilities and disabilities in higher functioning individuals with autism and asperger syndrome', *Journal of Autism and Developmental Disorders*, 37, 788-793.

Schopler, E. and Mesibov, G. (eds.) (1983). *Autism in adolescents and adults*. New York: Plenum Publishers.

Sharlanova, V. (2004). 'Experiential learning'. *Trakia Journal of Sciences*, 2, 36-39.

Siedentop, D., and Tannehill, D. (2000). *Developing teaching skills in physical education, 4th ed*. New York, NY: McGraw-Hill.

Simmons-Mackie, N. and Damico, J. (2003). 'Contributions of qualitative research to the knowledge base of normal communication'. *American Journal of Speech-Language Pathology*, 12, 144-154.

Smith-Myles, B. (ed.) (2007). *Autism spectrum disorders: A handbook for parents and professionals*. Westport, CT: Greenwood Publishing Group.

Starr, E., Szatmari, P., Bryson, S. and Zwaigenbaum, L. (2003). Stability and change among high-functioning children with pervasive developmental disorders'. *Journal of Autism and Developmental Disorders*, 33 (1), 15-22.

Steffen, J. and Stiehl, J. (eds.) (2010). *Teaching lifetime outdoor pursuits*. Champaign, IL: Human Kinetics.

Stenhouse, L. (1975). *An introduction to curriculum research and development.* London: Heinemann.

Stiles, D., Gibbons, J. and Schnellman, J. (1987). 'The smiling sunbather and the chivalrous football player: young adolescents' images of the ideal women and men', *Journal of Early Adolescence,* 7, 411- 427.

Stokes, K. (1977). 'Planning for the future of a severely handicapped autistic child'. *Journal of Autism and Childhood Schizophrenia,* 7, 288-297.

Susman, G. (1983). *Action research: A sociotechnical systems perspective*. London: Sage Publications.

Sutherland, S. and Stroot, S. (2009). 'Brad's story: An exploration of an inclusive adventure education experience', *Therapeutic Recreation Journal,* 43 (3), 27-29.

Sutherland, S. and Stroot, S. (2010). 'The impact of participation in an inclusive adventure education trip on group dynamics'. *Journal of Leisure Research,* 42(1), 153-176.

Syriopoulou-Deli, C. (2010). 'Autism: Sociological perspectives'. *Interdisciplinary Journal of Contemporary Research in Business,* 2(1), 118-131.

Smith, T., Groen, A. and Wynn, J. (2000). 'Randomized trial of intensive early intervention for children with pervasive developmental disorder'. *American Journal on Mental Retardation,* 105, 269-285.

Taheri, A., Perry, A. and Factor, D. (2014). 'A further examination of the DSM-5: Autistic spectrum disorder criteria in practice', *Journal on Developmental Disabilities,* 20 (1), 116-121.

Tannehill, D. and Dillon, M. (2007). *A handbook of ideas: Teaching adventure education.* Limerick: University of Limerick.

Tantam, D. (2003). 'The challenges of adolescents and adults with asperger syndrome', *Child Adolescents and Psychiatric Clinics of North America*, 12, 143-163.

Task Force on Autism (2001). *Educational provision and support for persons with ASD: The report of the task force on autism,* Dublin: Department of Education and Science.

Taylor, B., Jick H., and MacLoughlin D. (2013). 'Prevalence and incidence rates of autism in the UK: Time trend from 2004-2010 in children aged 8 years', *BMJ Open*, 16(3), 10.

Thomas, G. and Jolley, R. (1998). 'Drawing conclusions: A re-examination of empirical and conceptual bases for psychological evaluation of children from their drawings'. *British Journal of Clinical Psychology*, 37, 127-139.

Thompson B. (2007). 'Effect sizes, confidence intervals, and confidence intervals for effect sizes', *Journal of School Psychology*. 44, 423–432.

Timmreck, T. (2002). *An introduction to epidemiology: 3rd ed*. London: James and Bartlett Publishers.

Tindall, D., Neylon, J., Parker, M. and Tannehill, D. (2017). 'Promoting social inclusion and physical activity for students with special educational needs through adventure education' in Morin, A. Maïano, C., Lonsdale, C. and Creaven, R. (eds.) *Inclusive Physical Activities: International Perspectives*. Charlotte, NC: Information Age, 103-202.

Tse, J., Strulovitch, J., Tagalakis, V., Meng, L. and Fombonne, E. (2007). 'Social skills training for adolescents with asperger syndrome and high-functioning autism', *Journal of Autism and Developmental Disorders*, 37 (10), 1960-1968.

Tucker, A. (2009). 'Adventure-based group therapy to promote social skills in adolescents', *Social Work with Groups*, 32, 315-329.

Vaughan, S., Bos, C. and Schumm, J. (2011). *Teaching students who are exceptional, diverse and at risk in the general education classroom.* New York: Pearson.

Vince, R. (1995). 'Working with emotions in the change process: Using drawings for team diagnosis and development'. *Organisations and People*, 2, 11–17.

Vogel, D., Meyer, M., and Harendza, S. (2018). 'Verbal and non-verbal communication skills including empathy during history taking of undergraduate medical students'. *BMC Medical Education*, 18(1), 157.

Weiss M. and Harris S. (2001). 'Teaching social skills to people with autism'. *Behaviour Modification*, 25, 785-802.

Whalen, C., Schreibman, L., and Ingersoll, B. (2006). 'The collateral effects of joint attention training on social initiations, positive affect, imitation and spontaneous speech for young children with autism'. *Journal of Autism and Developmental Disorders,* 36 (5), 655-664.

Williams, S., Keonig, K. and Scahill, L. (2007). 'Social skills development in children with autism spectrum disorders: A review of the intervention research'. *Journal of Autism Developmental Disorder,* 37, 1858-1868.

William, S., Johnson, C. and Sukhodolsky, D. (2005). 'The role of the school psychologist in the inclusive education of school-age children with autism spectrum disorders'. *Journal of School Psychology*, 43, 117-136.

Wing, L. (1981). 'Asperger's syndrome: A clinical account'. *Psychological Medicine*. 11, 115–129.

Wing, L. (1996). *The autistic spectrum: A guide for parents and professionals*. London: Constable.

Wing, L. and Gould, J. (1979). 'Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification'. *Journal of Autism and Developmental Disorders*, 9, 11-29.

Winner, M. (2007). *Social behaviour mapping*. San Jose, CA: Think Social Publishing, Inc.

Winner, M. (2014). *Why teach social thinking? Questioning our assumptions about what it means to teach social skills.* San Jose, CA: Think Social Publishing, Inc.

Wolstencroft, J., Robinson, L., Srinivasan, R., Kerry, E., Mandy, W. and Skuse, D. (2018). 'A systematic review of group social skills interventions, and meta-analysis of outcomes, for

children with high functioning ASD', *Journal of Autism and Developmental Disorders*. 48(7), 2293–2307.

World Health Organization (1994). *International statistical classification of diseases and related health problems*. Geneva: World Health Organization.

World Health Organization. (2004). *International statistical classification of diseases and related health problems, (10th revision) 2nd ed.* Geneva: World Health Organisation.

World Health Organization (2018). *International statistical classification of diseases and related health problems (11th Revision)*. Geneva: World Health Organisation.

Yasmeen, G. (2008). 'Action research: An approach for the teachers in higher education'. *The Turkish Online Journal of Educational Technology*. 7 (4), 46 – 53.

Yu, C. and Ohlund, B. (2012). '*Threats to validity of research design: Creative wisdom'*, available at http://www.creative-wisdom.com/teaching/WBI/threat.shtml. [accessed on 14th April 2018].

Zachor, D., Vardi, S., Baron-Eitan, S., Brodai-Meir, I., Ginossar, N. and Ben-Itzchak, E (2016). 'The effectiveness of an outdoor adventure programme for young children with autism spectrum disorder: A controlled study'. *Developmental Medicine and Child Neurology*, 59 (5), 550 – 556.

Zohrabi, M. (2013). 'Mixed methods research: Instruments, validity, reliability and reporting findings'. *Theory and Practice in Language Studies*.3(2), 254 - 262.

Appendices

Appendix A – Ethics Approval

Thank you for your Research Ethics application which was recently reviewed by the Education and Health Sciences Research Ethics Committee.
The recommendation of the Committee is outlined below:

Project Title: 2015_05_12_EHS Exploring the Impact of Adventure Education on the Social Development of Students with Autistic Spectrum Disorder (ASD).
Principal Investigator: Melissa Parker
Other Investigators: Daniel Tindall, Jack Neylon
Recommendation: Approved subject to Minor Amendments/clarifications as outlined in the attached Feedback Sheet.

Appendix B – Consent Forms

Principal Information Sheet

Title of Project

Adventure education and social skills development in students with ASD.

The Study

This action research project involves exploring the impact of adventure education, in a physical education setting, and the development of social skills in students with ASD. During the project an adventure education scheme of work (communication, co-operation, trust, problem solving, and teamwork games) will be implemented as part of their physical education programme. Prior to implementation classroom teachers and SNAs will be interviewed as to the social skills of the boys with ASD. Teachers will then reflect daily on student social skills using the ILaugh framework. At the end of the study teachers will be interviewed a second time as to perceived changes in behaviour. Teacher participation is completely voluntary. Due to the fact that the adventure scheme of work is the content of students' regular physical education routine protocols for participation will be in place. If a student or parent/guardian does not desire to be part of the study the student will still participate but will not be observed or part of the conversation of the interviews.

Participation Information

Teachers and SNAs may participate in the study should they wish to do so by:

- Make comments at least once daily in a reflective journal
- Attending physical education classes
- Taking part in two focus group interviews

Students may participate in the following study should they wish to by:

- Agreeing to be observed in the adventure activities during their physical education classes.

All information gathered will remain confidential and will be used only for the purpose of this study. No information about the participants or the school will be identified in the final report. All information will be stored safely with access only available to the investigators. Data will be collected through reflection and observation of the students during both the physical education classes and classroom activities.

Any student who does not wish to participate, will still participate in the adventure education classes, however, their information or data will not be used in this study.

Permission:

Permission to do this study has been sought granted from the Education and Health Sciences Research Ethics Committee of University of Limerick.

The participants are under no obligation to participate in this study. Should you/they have any questions or do not understand something just ask the investigator to clarify the issue.

Contact Details:	Jack Neylon, University of Limerick, Tel: 087-3160099	Drs. Melissa Parker & Daniel Tindall, PESS Department, University of Limerick Tel: 061 234674

This research study has received Ethics approval from the Education and Health Sciences Research Ethics Committee (quote approval number). If you have any concerns about this study and wish to contact someone independent you may contact:

Chairman Education and Health Sciences Research Ethics Committee

EHS Faculty Office

University of Limerick

Tel (061) 234101

Principal Consent Form

I give consent for you to approach pupils, parents, and teachers to participate in the project titled "Adventure education and social skills development in students with ASD.

I have read the Project Information Sheet explaining the purpose of the research project and understand that:

- The role of the school is voluntary.
- I may decide to withdraw the school's participation at any time without penalty.
- Teachers and pupils will be invited to participate and that permission will be sought from them and their parent/guardians.
- All information obtained will be treated in strictest confidence.
- The teachers' and students' names will not be used and they will not be identifiable in any written reports about the study.
- The school will not be identifiable in any written reports about the study.
- Participants may withdraw from the study at any time without penalty.
- A report of the findings will be made available to the school if desired.
- I may seek further information on the project from Dr. Melissa Parker (061 234674) or Dr. Daniel Tindall (061 234828) if necessary.

Principal: _____

Signature: _____

Date: ___ / ___ / _____

Student/Participant Information Sheet

Title of the Study:

Adventure education and social skills development in students with ASD.

The Study

- Your participation is requested to be part of this study.
- To see if adventure education can impact the social skill development of students with ASD.
- Adventure Education is a strand on the physical education curriculum.
- Adventure Education will include activities relating to communication, co-operation, trust, problem solving and teamwork.
- The teachers and SNAs will observe these classes, and keep a reflective journal at the end of the day.
- No names will be used in any written form of the report.

If you opt out of this study, you will still take part in the all aspects of the July Provision Programme, however, no information or data concerning you will be used.

What will I have to do as a Participant

- Take part in the adventure education classes, during normal physical education classes.
- If you want to withdraw at any time you can, and still get to take part in the adventure education programme. You will not be observed in this case.

What are the risks

- No names will be used in any of the notes or reports completed during this study.
- The only people who will be observing the classes, are the normal SNAs and teachers that see you everyday during normal school time.

If you have any questions about the study or would like to withdraw, you can:

- Ask any SNA or teacher.
- Write a note to any SNA or teacher.
- Ask your parents to ask us.

Confidentiality

All information will be kept confidential. All information gathered will be stored in a secure location in the University of Limerick's PESS Department and shall be availible to the researcher and his supervisor only. No information about you, the subject, will be indentified in the final report. Students will remain anonymous throughout the study.

Researcher Contact Details:	Jack Neylon, University of Limerick, Tel: 087-3160099	Drs. Melissa Parker & Daniel Tindall, PESS Department, University of Limerick Tel: 061 234674

What if I have more questions or do not understand something?

This research study has received Ethics approval from the Education and Health Sciences Research Ethics Committee (quote approval number). If you have any concerns about this study and wish to contact someone independent you may contact:

Chairman Education and Health Sciences Research Ethics Committee

EHS Faculty Office

University of Limerick

Tel (061) 234101

Student/Participant Consent Form

Title of Research: Adventure education and social skills development in students with ASD.

Please read the following questions and tick the appropriate yes or no box. Please sign the bottom of the page if you consent to participate in this study.

	Participant	
	Yes	*No*
I have read and understand the student information sheet		
I understand what the project is about and what the results will be used for		
I am fully aware of all procedures and of any risks and benefits associated with the study		
I know that my participation is voluntary and that I can withdraw from the project at any stage without giving reason		
I am aware that the results will be kept confidential		

Participant (Block Letters): _____ Signature: _____ Date: ___ / ___ / _____	Witness (Block Letters): _____ Signature: _____ Date: ___ / ___ / _____

Parent/Guardian (Block Letters): _____ Signature: _____ Date: ___ / ___ / _____	Investigator (Block Letters): _____ Signature: _____ Date: ___ / ___ / _____

Parent/Guardian Information Sheet

Title of Study:
Adventure education and social skills development in students with ASD.

The Study:
This study is being carried out to investigate if the implementation of adventure education, in a physical education setting, can help foster social skills development in students with ASD.

Procedures:
This project involves exploring the impact of adventure education, in a physical education setting, and the development of social skills in students with ASD. During the project an adventure education scheme of work (communication, co-operation, trust, problem solving, and teamwork games) will be implemented as part of their physical education programme. Teachers and SNAs will observe students' reactions and experiences, keeping a track of any social skill development that may occur as a result of the intervention. If a parent/guardian does not desire to be part of the study, students will still participate but will not be observed or part of the conversation of the interviews.

Benefits:
I would hope that as a result of taking part in this study that the pupils' social skills will show signs of improvement. Furthermore, it would help in highlighting adventure education as social skill intervention for students with ASD. A report will be furnished at the end of the project, which will be made available to all parents.

Risks:
There will be no risks to parent or child involved in this project but you are still under no obligation to participate in this study. As mentioned above, this framework and testing will be part of the pupil's physical education lessons, during the July Provision Programme. By agreeing to partake in this study you allow your child's results to be used as part of the research.

Voluntary Participation:
Taking part in this study is purely voluntary. There is no money or any other reward for taking part in this study.

Permission:
Permission to do this study has been granted from the Education and Health Sciences Research Ethics Committee of the University of Limerick.

Confidentiality:
All information will be kept confidential and used only for the purpose of this study. All information gathered will be stored in a secure location at all times and shall only be available to the researchers involved. No information about the subjects will be identified in the final report.

Researcher Contact Details: Jack Neylon, University of Limerick,

Tel: 087-3160099

Drs. Melissa Parker & Daniel Tindall,

PESS Department,

University of Limerick

Tel: 061 234674

Further Information:

This research study has received Ethics approval from the Education and Health Sciences Research Ethics Committee (quote approval number). If you have any concerns about this study and wish to contact someone independent you may contact:

Chairman Education and Health Sciences Research Ethics Committee

EHS Faculty Office

University of Limerick

Tel (061) 234101

Parent/Guardian Consent Form

Title of Research: Adventure education and social skills development in students with ASD.

Please read the following questions and tick the appropriate Yes or No box.

Please sign the bottom of the page if you consent to participate in this study.

	Yes	No
I have read and understood the information sheet.		
I know my child's participation is voluntary and he/she can withdraw from the project at any time.		
I know and understand the relevant risks and benefits attached to participating in this study.		
I understand that my child's anonymity will be ensured throughout this study.		
I agree to my child participating in this study.		
I give permission that my child's data can be used anonymously in report format and published output (e.g. journal publication).		

	Signature	**Block Capitals**	**Date**
Parent/Guardian			
Investigator			

Teacher/SNA Information Sheet

Title of Project

Adventure education and social skills development in students with ASD.

The Study

Your participation is requested in an action research project that involves exploring the impact of adventure education, in a physical education setting, and the development of social skills in students with ASD. During the project an adventure education scheme of work (communication, co-operation, trust, problem solving, and teamwork games) will be implemented as part of their physical education programme.

Participation Information

Teachers and SNAs may participate in the study should they wish to do so by:

- Make comments at least once daily in a reflective journal
- Attending physical education classes
- Taking part in two focus group interviews.
- This will require 15 additional minutes at the end of each day, writing observational notes and keeping a reflective journal. These notes will form part of the data used in this project.
- 2 hours will also be used for a focus group interview, involving all teachers and SNAs. These focus group sessions will be audio-recorded.

There are no risks involved in this study. All information gathered will remain confidential and will be used only for the purpose of this study. No information about the participants or the school will be identified in the final report. All information will be stored safely with access only available to the investigators. Data will be collected through reflection and observation of the students during both the physical education classes and classroom activities.

If you opt out, you will be under no obligation to complete either the interview, the reflective journal, or any other aspect of this study.

Permission:

Permission to do this study has been sought granted from the Education and Health Sciences Research Ethics Committee at the University of Limerick.

The participants are under no obligation to participate in this study. Should you/they have any questions or do not understand something just ask the investigator to clarify the issue.

Contact Details:	Jack Neylon, University of Limerick, Tel: 087-3160099	Drs. Melissa Parker & Daniel Tindall, PESS Department, University of Limerick Tel: 061 234674

If you have concerns about this study and wish to contact someone independent, you may contact:

This research study has received Ethics approval from the Education and Health Sciences Research Ethics Committee (quote approval number). If you have any concerns about this study and wish to contact someone independent you may contact:

Chairman Education and Health Sciences Research Ethics Committee

EHS Faculty Office

University of Limerick

Tel (061) 234101

Teacher/ SNA Consent Form

I give consent for you to approach pupils to participate in the project titled "Adventure education and social skills development in students with ASD".

Please read the following questions and tick the appropriate yes or no box. Please sign the bottom of the page if you consent to participate in this study.

	Participant	
	Yes	*No*
I have read and understand the student information sheet		
I understand what the project is about and what the results will be used for		
I am fully aware of all procedures and of any risks and benefits associated with the study		
I know that my participation is voluntary and that I can withdraw from the project at any stage without giving reason		
I am aware that the results will be kept confidential		

Participant (Block Letters):	Witness (Block Letters):	Investigator (Block Letters):
_____	_____	_____
Signature:	Signature:	Signature:
_____	_____	_____

Date: ___ / ___ / _____	Date: ___ / ___ / _____	Date: ___ / ___ / _____

Teacher/SNA: _____

Signature: _____

Date: ___ / ___ / _____

Appendix C – Sample Reflection Entry

Tracey – Reflective Journal – June 2017 – Year 1 – Week 1

Monday

X arrived at school complaining that he felt unwell, while smiling. He wanted me to call his parents so he could be brought home. He wouldn't usually look to go home, but he didn't seem sick, so I insisted that he stay until break time, when we would reassess the situation.

He didn't attend the first 2 classes, missing maths and English, and was brought for a walk with an SNA instead. He was in much better form by break time. He enjoyed sitting with the group at break time, but did have an argument with X by the end of the break. These two students are a similar age and have similar interests, but X seems to enjoy rising him, as he knows he will get quite a reaction.

In Home Economics, the X was very vocal about his cooking abilities and what he was willing to eat. His tone of voice and the volume at which he speaks can annoy and upset the others. The other students all worked very well together during Home Ec, and seem to enjoy working together in small groups. One pairing, X & X worked extremely well together and seemed to enjoy conversations about music and other common interests.

Tuesday

D.W. was absent today. The group was very content and quiet, and many of the boys commented on the change of dynamic as DW was not in.

During music, C.M. seemed to get upset when he couldn't perform as the others could. Though he is very musical, he is not a music student, so wouldn't have learned to play an instrument during the academic year like the others do. I asked an SNA to sit beside him so she could model the correct way of playing and could encourage him to keep trying. He turned his head and began muttering under his breath (this is how he normally reacts when he feels under pressure). He closed the lid on the xylophone, and Jack offered him a shaker, but he refused. He possibly felt singled out when the SNA sat beside him, and it was an obvious sign to the other students that he needed help, which embarrassed him. I think it might be a better idea to offer him a choice of instrument in future, and perhaps sit in a circle so he can clearly see how others are performing around him, and perhaps learn from that.

For SESE, the students worked in groups identifying the countries on a blank map of Asia. They defiantly work better in groups and seem to enjoy each other's company. I could not believe that there weren't more problems with the change in timetable. Usually, there would have to be a significant amount of coaxing. This was really positive.

Wednesday

X was back in school today. His behaviour has been causing upset to others, and is causing a lot of stress to himself. In order to promote positive behaviour, and to avoid tantrums, we designed a reward chart, and identified the behaviours that have caused most problems for him and others. The 5 areas identified were:

- Volume of voice
- Getting along with others
- Listening
- Participating in class
- Following teachers' instructions

The times that were being monitored were:

- Morning classes
- Break time
- Mid-morning classes
- Lunch time
- Afternoon classes

I put a picture of his favourite TV characters on it. I showed this to X and explained that he needed to get 20 of the 25 ticks in order to get a reward at the end of the day. During this conversation, I asked him about his triggers and the causes for his behaviours. He said that he is unable to regulate his emotions due to his ASD, and that X upsets him when he tells jokes. This seems to happen particularly at lunch and break times, and can cause a lot of arguments among, especially among the younger students.

I then spoke to X on his own about his and he agreed to avoid telling jokes around X. I also spoke to the class group about X's triggers and everyone agreed not to tell jokes around him. X seemed extremely happy that I had addressed his concerns and was beaming for the rest of the morning. There was an immediate change in his behaviour and managed to get all 25 ticks completed. He was brought to the shop and picked out a treat. Hopefully this improved behaviour can continue for the remainder of the course!

15/06/2017 – Thursday

We continued with X's reward chart today. It is having a massively positive impact on his behaviour, and therefore, on the whole group. His volume of voice, ability to listen, to get along with the group and following teachers' instructions have all improved. This is especially evident during unstructured times, and break and lunch times.

Hid classmates have not been complaining about him, as they usually would have, and X is making a very concerted effort to avoid upsetting him. It was really nice to see the students interacting so well during the adventure activities today. We have looked at so many social programmes that might help the boys. We have even purchased 3 or 4 different programmes over the last few years. They all follow the same pattern and try to get the students to learn routine social skills, such as making phone calls or booking an appointment. While they have learned how to do this, they still were not interacting with each other socially. It was really surprising to see the students interact with each other so positively today during the communication activities. Some of them showed levels of communication that I have not seen before in our regular social education classes, or indeed any other class.

16/06/2017 – Friday

We went on a trip today, we went bowling and then kayaking. The students split into 3 groups for bowling, D.W. went on his own. We had gone bowling recently and he was unable to turn take, and was very content playing on his own so we opted for this today. The rest of the group got on very well and enjoyed their morning.

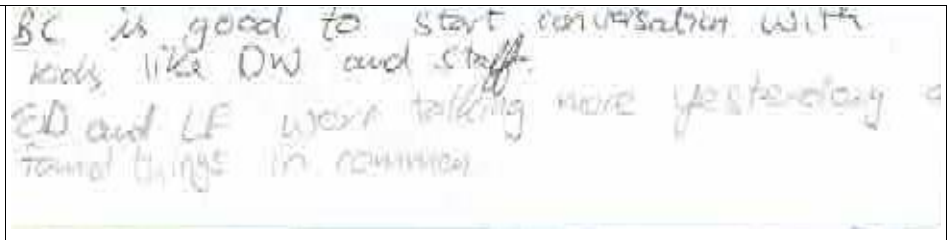
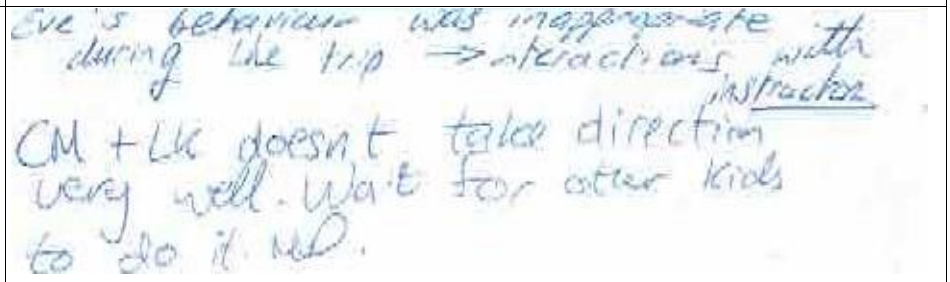
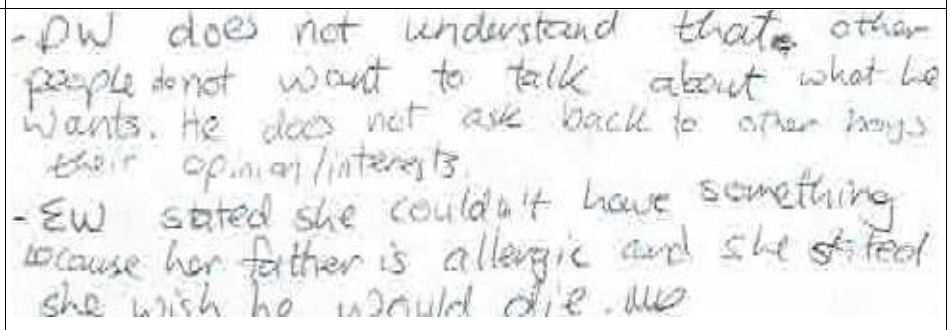
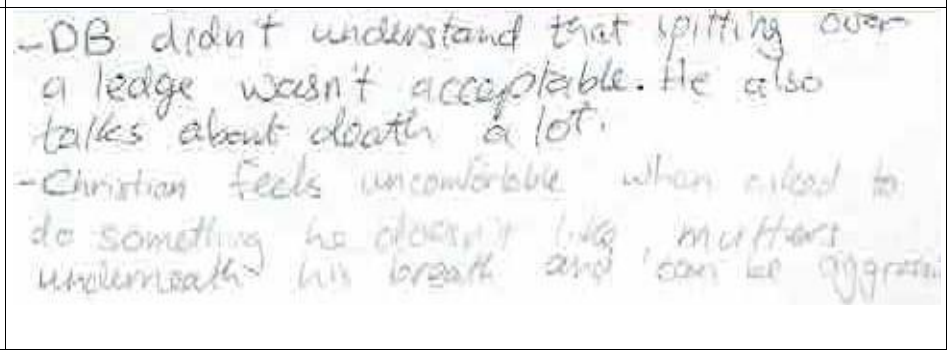
We then went kayaking. The student has to change under a tree in small groups, before and after the activity, which proved to be quite awkward for some.

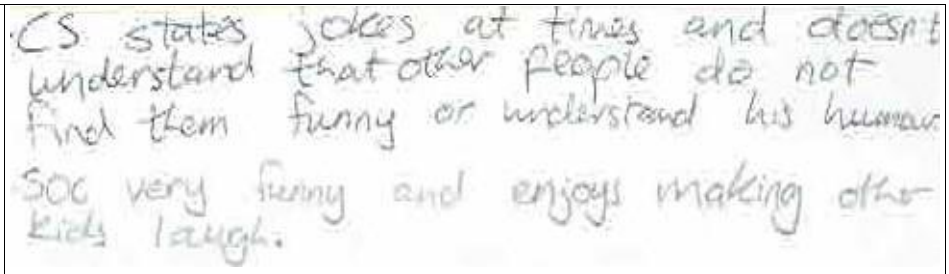
During the kayaking, students were in pairs in the boats. Some groups were very well matched and worked excellently together. One group of boys, X & X are much quieter and much poorer communicators, and were stuck behind a bank of reeds for a little while before we noticed them. They needed a lot of instruction to get them out of the area, and into the main body of the lake. After that, they worked well together and were well able to keep up with the group. X & X needed some instruction also, as X coordination is not the best. X was well able to get his point across and they soon got into their rhythm. X was in a kayak with Jack. He was in the front and complained that he was too small to row. Jack ended up doing all of the rowing. The other teams all worked very well together and all seemed to enjoy their afternoon.

X was unable to get himself dried and dressed under the tree. We told him to bring his belongings onto the bus and to get dressed there. It is quite a struggle for him to dress himself and must get a lot of assistance with this at home.

Appendix D – Sample Observational Log

ILAIJGH Framework for Social Thinking

	Initiation	
L	Listening with One's Eyes & Brain	
	Abstract and Inferential	
	Understanding the perspectives of Other's	
	Getting the Big Picture	

—	Humour	

CS states jokes at times and doesn't
understand that other people do not
find them funny or understand his humour
SOC very funny and enjoys making other
kids laugh.